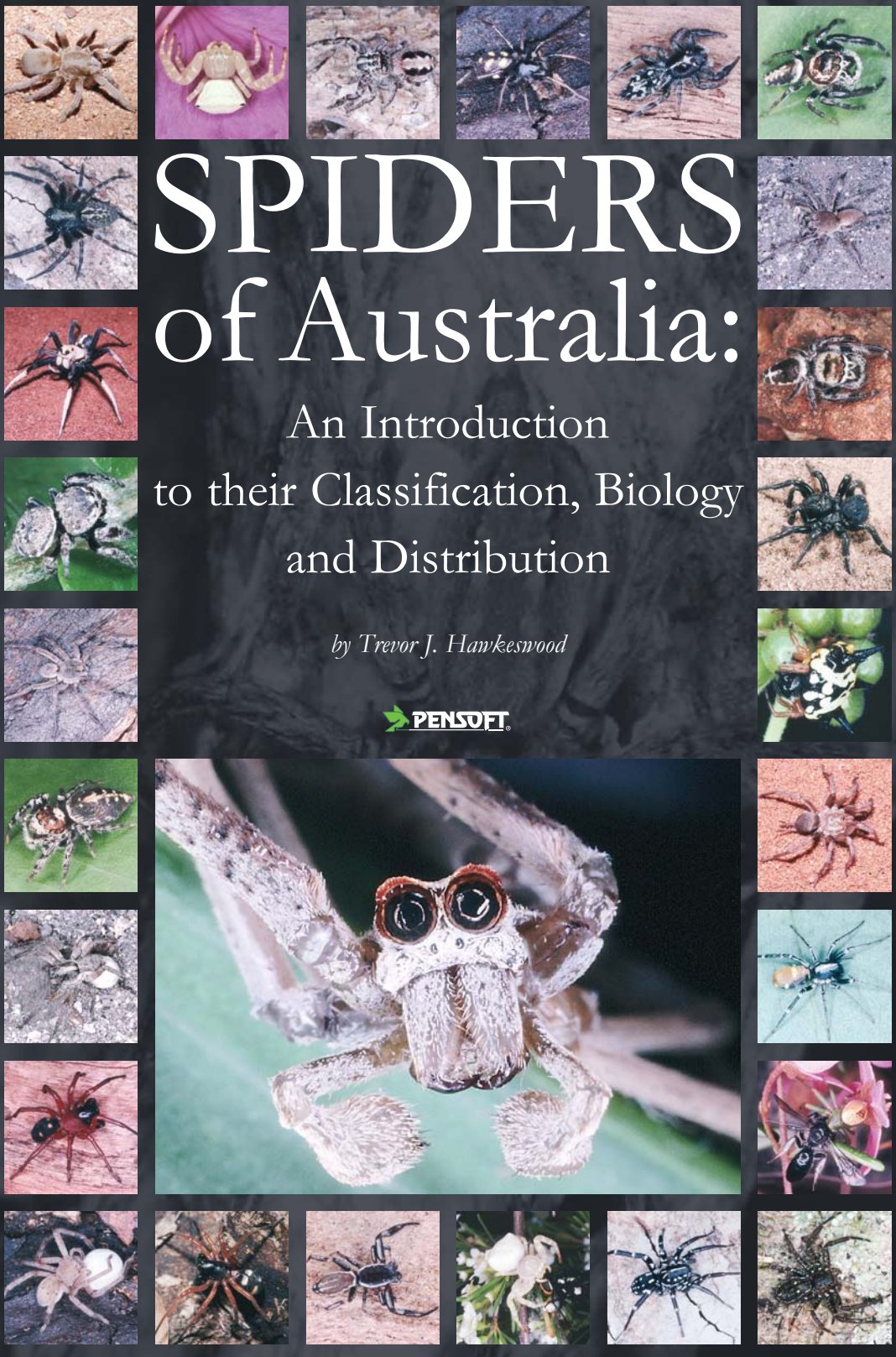

SPIDERS of Australia:

An Introduction to their Classification, Biology and Distribution

by Trevor J. Hawkeswood

PENSOFT

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with photographs by
B. Coulson, T. J. Hawkeswood, C. J. Parker and M. Peterson
and paintings by J. R. Turner

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by

Dr. Trevor J. Hawkeswood

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This book is dedicated to my daughter Jacqueline Lisa Hawkeswood
and to my first wife Vilma Basalo who collected many of the spiders illustrated
in this book and who assisted in many other ways

Preface

Spiders are well-known to many people as usually "nasty" creatures which possess a painful, often fatal, bite and which usually lurk in hidden places around homes and gardens. However, to most naturalists, spiders represent a most interesting and rewarding source of study. Despite the popular view of the nasty spider (which is unfortunately often promoted by certain museum workers who should know better), most spiders, although poisonous, are not dangerous to human beings. On the contrary, most spiders are very useful in keeping down populations of pests such as flies and mosquitoes which are known carriers of disease and are thus a larger threat to human health than the spiders. As such, spiders should be encouraged and not exterminated both in agricultural areas and in residential vegetable and flower gardens. As a group, the arachnids, i.e those arthropods with eight legs including spiders) are one of the most ancient of the invertebrates (i.e. those animals lacking a backbone), having evolved for over 320 million years. Many spiders have remained unchanged over many millions of years. In Australia, despite the presence of over 1800 described species, the study of spider biology and classification has been sadly neglected. This has largely been due to the limited number of people with expertise in these areas and the lack of employment opportunities. Only in recent years has the taxonomy or classification of some of the larger and more distinctive species and a number of smaller-sized species of spider been elucidated, but the biology and behaviour of most of the Australian fauna are totally unknown. Even the existing data on some of the more common species which are frequently encountered are either contradictory or incorrect, which indicates that much more field and laboratory research needs to be undertaken before even an adequate understanding of these species is reached.

When I was a boy living in the Blue Mountains of New South Wales, Australia during the early 1960's, I often wandered after school into the surrounding sandstone bushland near my parents home and there I encountered a myriad of plants, insects and spiders, most of which I could not identify nor find any information about. At this time there was a paucity of decent, well-written and comprehensive natural history books on the Australian flora and fauna (with the possible exception of the birds) and there was very little available to the layperson dealing with insects and

spiders. However this situation did not deter me from further study but only encouraged me to observe and write about these often secretive but mostly fascinating creatures, a pastime which has continued into later life. This interest has resulted in over 250 scientific papers and other articles. For all of my adult life I have been interested in the biology of insects and spiders, their conservation and the dissemination of scientific knowledge about them to the public. I have collected these invertebrates in many areas of Australia and South-East Asia and such field work is necessary for a broad but accurate understanding of their ecology and taxonomic relationships.

Over the years my interest in spiders has not waned and I hope that this book may provide an impetus for others interested in spider natural history in order to study and record observations on spider life-histories and biology, not just in Australia. Due to the paucity of books on Australian native arthropods available to the public, I decided in 1979 to write a series of books on Australian invertebrates since I felt that there was a definite need for more popular or semi-scientific books on these subjects which would provide relative up to date information on the subject. However, to accomplish a spider book of this type, a good coverage of species needed to be photographed from many parts of Australia, and the required number has been achieved only recently. Most of the photography has been done in New South Wales and Queensland, areas which were more accessible to me and some of the other photographers involved in the project, so readers will have to excuse the bias towards species from these regions. However, many of the species illustrated in this book have a very widespread (often cosmopolitan) distribution, occurring in other States and countries. In addition, the spider fauna of Queensland and New South Wales is the most diverse of any State in Australia in terms of families, genera and species, so that in fact, the bias towards spiders from these areas may be justified. This book is not intended to be a comprehensive nor exhaustive account of the Australian spider fauna, but does attempt to illustrate a wide selection of the most common and widespread species which would be distinctive to naturalists, bushwalkers and others when encountered in the field. Most of the species illustrated and discussed here are well-known but some are very uncommon and rarely seen by the general naturalist. Species from all Australian States are represented in this book.

The main aim of the present contribution is to make people aware of the diverse spider fauna of Australia and to provide them with detailed information on the selected species, based on available published research and from my own personal observations in many areas of Australia, so that they may be able to appreciate the important ecological roles of spiders in the natural environment. It is most likely that many native spiders are becoming scarce as a result of habitat destruction by

Humankind while others may have already become extinct or have suffered widespread local extinctions. While it is true that many spider species have a widespread distribution, many spiders also have a very localized range so that they are more susceptible to extinction through loss of habitat. Many species of Thomisidae are in this category and it is known that there are a number of undescribed, endemic species in the Sydney Bioregion and their biologies and precise distribution are unknown. It is imperative that the spider fauna is fully documented before too many species are extirpated and that this information be presented and made freely available so that many species may be conserved.

A number of people have greatly assisted me in this project. Firstly, I would like to thank the other photographers, Ms Brenda Coulson, Mr. Christopher Parker and Mr. Magnus Peterson for their enthusiasm and support, and in particular to Chris Parker who lent me camera equipment and assisted with the photography of a number of the spiders. The well-known author and artist, Mr. J.R. Turner of Sydney, New South Wales provided the wonderful colour paintings of species not covered by the photography. Mr. Paul Forster of Brisbane, Queensland, read through an earlier version of the manuscript and offered numerous suggestions for improvement and checked spelling, grammar etc. I also thank my brother, Mr Brian Hawkeswood for accompanying me on many field trips in eastern Australia, especially those undertaken together when I was in my twenties. I also thank Mr N.A. Radloff of Toowoomba, Queensland for permission to collect spiders on his property at Rungli Downs during the 1980's and for encouragement over the years and to Mr G. James of Alberton, Victoria, who sent me many live spiders from his local area for identification and use in this book. Lastly, but not least, I would like to thank my mother, Mrs D.E. Hawkeswood for facilities and assistance which enabled earlier drafts of the book to be written.

Lastly but not least, I would like to thank the following for sending me reprints of their works over a number of years or in more recent times: Dr R. Jocque (Belgium), Dr Richard Bradley (USA), Dr W.G. Eberhard (Costa Rica), Dr M. Zabka (Poland), Dr B.Y. Main (Western Australia), Dr C. Vink (New Zealand), Dr V.W. Framenau (Western Australia), Dr N. V. Korszniak (Victoria), Dr G. Uhl (Germany), Dr R.R. Jackson (New Zealand) and the late great Dr Struan Sutherland (Victoria).

Dr Trevor J. Hawkeswood
North Richmond, New South Wales, 2003

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Introduction

General

Spiders, along with scorpions, ticks, mites, false scorpions, sea-spiders and harvestmen, are 8-legged, jointed animals belonging to the order Arachnida. This group contains over 20,000 species distributed throughout the world, which are classified into about 65 families (see notes on classification in a later section). About 1800 species of spider have been recorded from Australia, but this number is certain to rise dramatically once the fauna is better documented. Many new species, and sometimes previously unknown genera and even families, are discovered each year. The biology, behaviour, life-cycle and distribution of some species have been described by arachnologists (i.e. those people seriously studying spiders) in detail, but for most species, little information is available on these aspects. Even for the most common species, there is an enormous amount of data yet to be gathered before a better understanding of spiders and their roles in the environment are reached. Indeed, naturalists should be encouraged to record and publish their findings for those also interested in the serious study of spiders and their conservation. In the following pages of this book, the general morphology, life-histories, behaviour and classification of Australian spiders are briefly outlined. A list of dangerous species known to be harmful to humans is provided. The main part of this book consists of the individual descriptions of the representative families, genera and species. In the species descriptions, the description of the female spider of each species is provided first unless otherwise stated. The reference list at the end of the book provides an insight to most of the important scientific literature regarding the Australian fauna, and consists mostly of taxonomic and biological papers. It should provide a valuable resource for those more serious students.

Morphology of the adult

The body of a spider consists primarily of two sections, the cephalothorax and the abdomen, which are connected by a thin tube known as the pedicel (Fig. 1). The cephalothorax, which is the front portion of the body, is also known as the prosoma (Fig. 1). The prosoma consists of two regions. At the front is the head region (sometimes called the caput) which bears the eyes dorsally and the mouthparts and jaws ventrally. The remaining part of the prosoma is analogous to

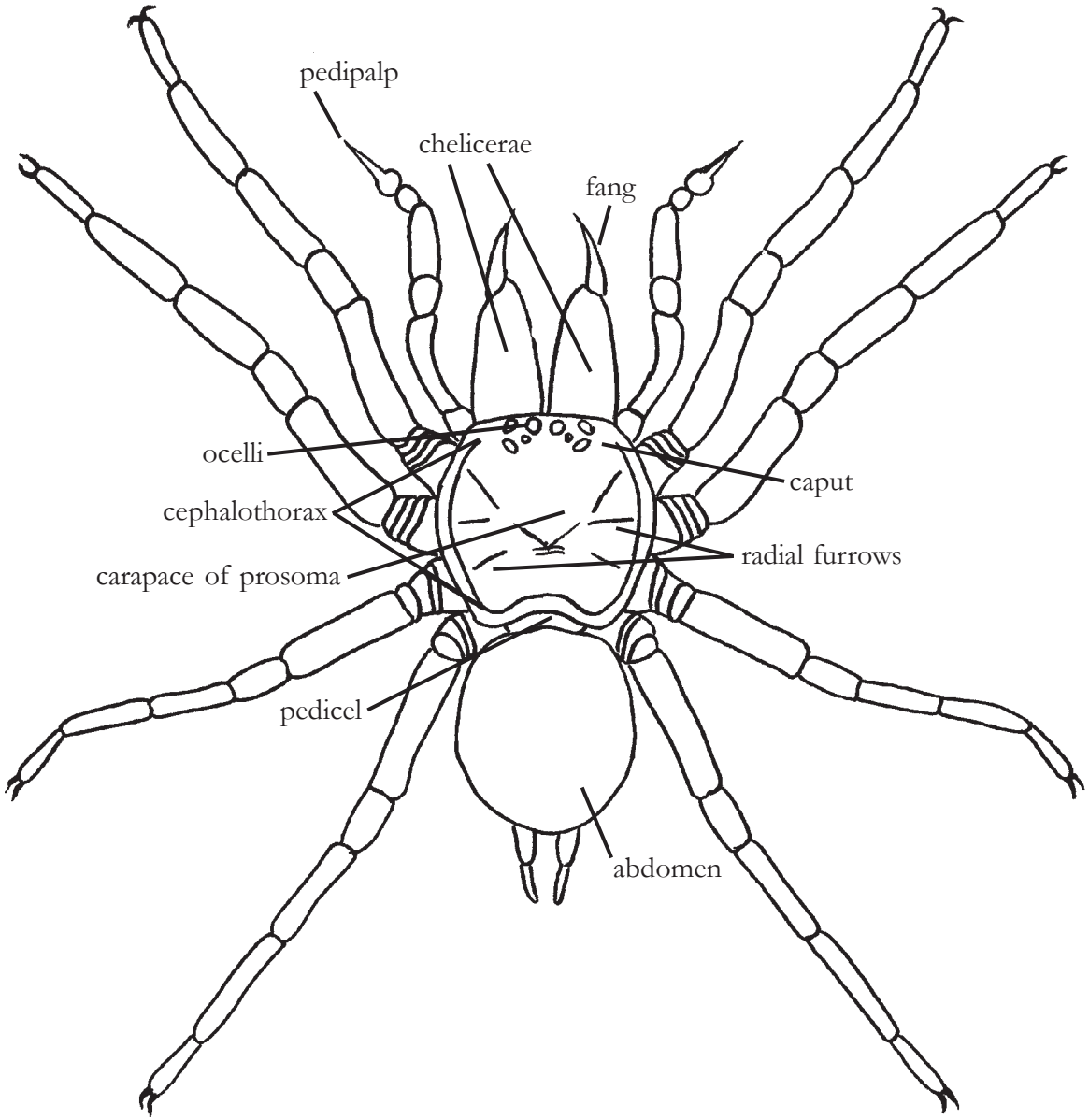

pedipalp
chelicerae
fang
ocelli
caput
cephalothorax
radial furrows
carapace of prosoma
pedicel
abdomen

Fig. 1.

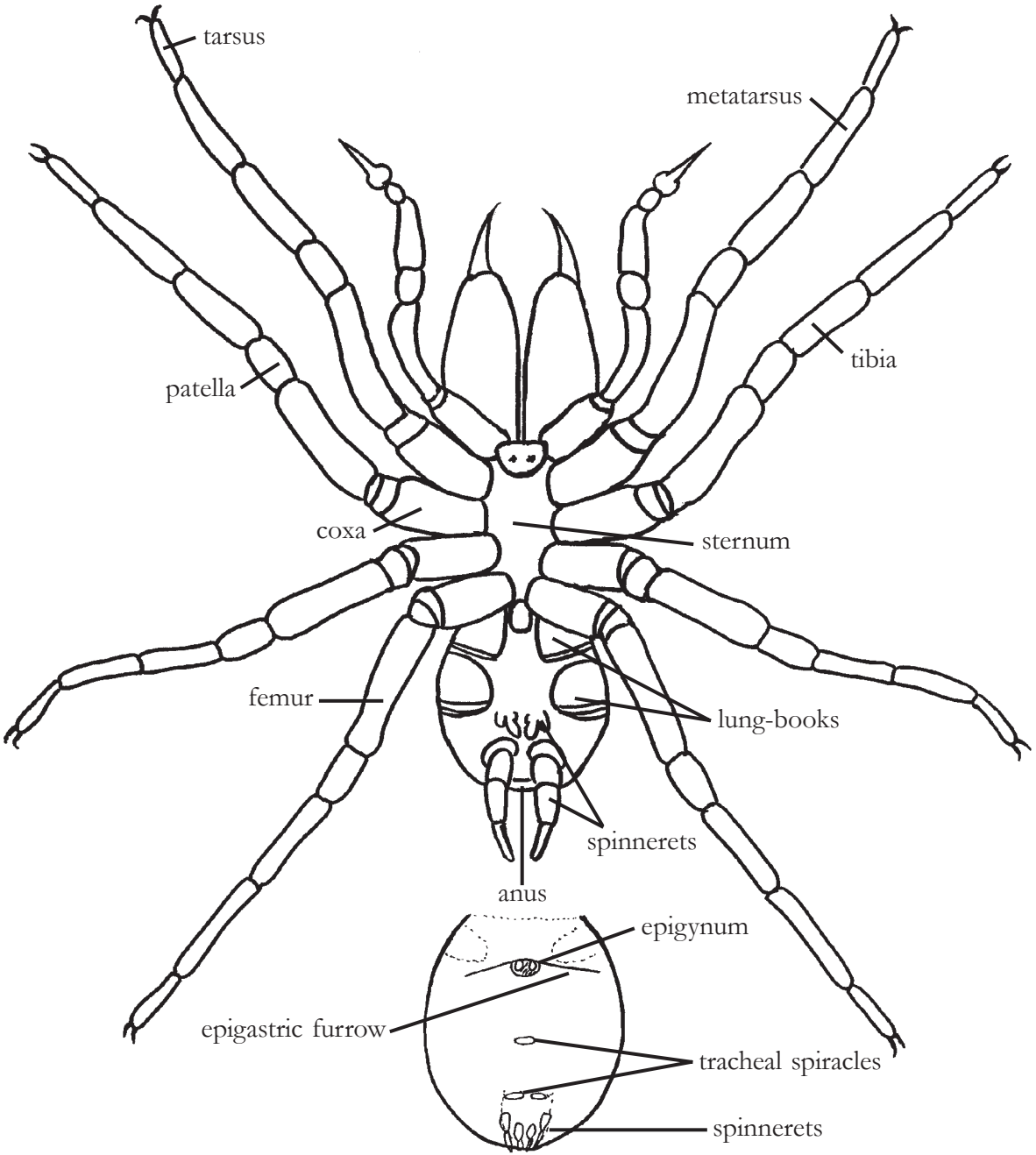

tarsus
metatarsus
tibia
patella
coxa
sternum
femur
lung-books
spinnerets
anus
epigynum
epigastric furrow
tracheal spiracles
spinnerets

Fig. 2.

the insect thoracic region and is the part of the body to which the eight legs are attached to the undersurface (Fig. 2). In spiders, the divisions between the two regions is obscure and ill-defined. Unlike insects, the head of a spider is never separated from the thorax by a neck or joint. In turning the head around to observe a moving object, a spider needs to swivel the entire cephalothorax at the pedicel. The dorsal part of the cephalothorax is known as the carapace (Fig. 1) which is a strong shield largely composed of chitin, a complex chemical constituting the exoskeletons of insects, spiders and other arthropods. The corresponding strong plate of chitin covering the undersurface of the prosoma is known as the sternum (Fig. 2). The carapace usually possesses a distinctive depression known as the thoracic fovea and often radial furrows. They correspond to the inside attachment of the various thoracic muscles. The margin between the anterior row of eyes and the front margin of the carapace is known as the clypeus. The sternum is usually shield-shaped and deeply grooved around the lateral margins to allow movement of the bases of the legs (or coxae) (Fig. 2).

The eyes of most spiders are situated at the front edge of the carapace and consist of simple ocelli, i.e. they are not compound as are those of insects and other arthropods. Most spiders have eight eyes, although in some families, this number may be reduced to six, four or two. Some species lack eyes and are thus totally blind. Spider eyes may be arranged in a number of patterns, but most spiders have an arrangement of two rows of four eyes. Usually the eyes are positioned in front of the head. However, in wolf spiders (family Lycosidae), the eyes are arranged in three rows; one row of four eyes is situated at the front of the head followed by two very large eyes, while the third row of two eyes is placed at the top of the head. In other spiders such as the mygalomorphs [i.e. trap-doors (family Idiopidae), funnel-webs (family Nemesidae) and bird-eating spiders (family Theraphosidae)], the eyes may be grouped together on a raised portion known as the ocular tubercle. In a few families [e.g. Pholcidae, Theridiidae], the eyes may be mounted on a very high narrow projection like a periscope; presumably this adaptation provides the spider with a clear, overall view of its environment and is often related to mating behaviour. The eyes of spiders are usually of two types- some are pearly-white in appearance and are known as nocturnal eyes, while others are dark in colour and are known as diurnal eyes. However, the distinctions between these two types is not always clear, although in some cases, they may be useful in identification of particular species, since some spiders have all nocturnal eyes, others have all diurnal eyes, while others possess a combination of both. Most spiders that are active at night possess nocturnal eyes.

The mouthparts of spiders are adapted for squeezing/crushing their victims since they do not eat solid food as do most insects and other animals, but suck the fluids from the

bodies of the prey which they capture. The first pair of appendages of the cephalothorax are known as the chelicerae, with which the spider grasps and kills its prey. Each chelicera consists of two parts, the first of which is the basal segment which is attached to the head, while the second segment is the curved process or fang. In most spiders, the movement of the chelicerae is lateral, i.e. the fangs move towards each other. In the mygalomorph spiders, the fangs project forwards and move vertically downwards [i.e. the mygalomorph spider raises its cephalothorax and strikes downwards at its prey]. Inside the head of araneomorph spiders, are situated the poison glands which produce the deadly venom which is so effective in paralysing and killing prey. In the mygalomorph spiders, the poison glands are located in the upper part of the chelicerae and not in the head. However, in both groups of spiders, the venom flows through a duct (canal) which opens near the tips of the fangs. The second pair of appendages are the palps which are usually composed of six segments and are situated one either side of the mouth. The basal segment, known as the coxa, is extended inwards and upwards on either side of the mouth to form a pair of crushing plates (known as the maxillae) which, with the chelicerae, are responsible for squeezing the prey to release the body fluids. The two slender palps project outwards from the front of the spider body. They differ in shape depending on the sex of the spider. The tarsus (or terminal segment) of the male palps is usually prominently swollen at the apex and is modified into a complex mating organ. These palpal organs are often smooth and glossy on the outer surface, and when moving along, these male spiders appear to wearing miniature boxing gloves! The palpal organs clearly distinguish the sexes and are used by the male spider for placing the sperm within the female during mating (see below). Between the maxillae and attached to the sternum is the chitinized labium or lower lip. In some families, the lip is entirely fused to the sternum and is unable to move [e.g. in the Pholcidae, Daddy-long Legs]. The straining of the body juices of the prey is undertaken by tufts and row of special hairs (or setae) on the edges of the maxillae and mouth.

There are four pairs of legs in spiders and this fact clearly distinguishes them from insects which have three pairs. Each leg has seven segments known as the coxa, trochanter, femur, patella, tibia, metatarsus and tarsus (in order from the body outwards). The coxa, trochanter and patella are usually short in length. The legs (and also their segments) are numbered as legs 1,2,3,4 (numbering from the front to the back legs). The legs of spiders may be grouped into two basic types. In most spider families, the legs are prograde, i.e. the anterior two pairs of legs are positioned forwards, while legs 3 and 4 face backwards. The legs of the families Sparassidae (Huntsmen Spiders) and Thomisidae (Flower or Crab Spiders) are able to move sideways as well as forwards; this type is termed laterigrade. The legs are normally covered with spines, fine to stouter hairs and/or micro-hairs (known as trichobothria) and other armature. At the

end of the tarsus of each leg are the tarsal claws which in most families number three per tarsus (with one claw curved downwards between the other two), while in other families, the claws number two per tarsus. The dorsal claws usually have distinctive teeth or serrations on the edges. In some families, there is a prominent tuft of stiff hairs below the claws. Each hair has a serrated edge and a strongly subdivided distal end and these, when grouped together, enable the spider to cling successfully to slippery or irregular surfaces. Some spiders may possess a continuous, undivided row of stiff hairs along the ventral surface of the tarsus or metatarsus of some or all of the legs; these tarsal brushes are known as scopulae. In addition to these hairs, the legs of many spiders posses bristles, often distinctive in form and often of some taxonomic significance. For instance, the Comb-footed Spiders of the family Theridiidae possess a comb of serrated bristles on the tarsus, while some families such as the Uloboridae, Desidae and Deinopidae have a special comb or calamistrum on the dorsal surface of the fourth metatarsus which is used for combing out silk from the special silk-producing organ, the cribellum (see below). On the legs of most spiders are a number of fine, slender, sensory hairs which rest perpendicular to the surface of the leg and are known as trichobothria.

The abdomen in many spiders is the largest portion of the body and assumes various shapes, sizes and coloration, depending upon the species. It is usually much softer than the cephalothorax and legs. The ventral surface of the abdomen displays the openings of the reproductive, respiratory and digestive systems of the spider. Near the anterior margin of the undersurface of the abdomen are two or four pale white to yellow, rounded patches which correspond to the position of the respiratory (breathing) organs of the spider known as the book-lungs (or lung-books)(Fig. 2). These function to renew the oxygen supply to the blood system of the spider. Most araneomorph spiders possess two book lungs while mygalomorph spiders have four book-lungs. Those spiders which possess only one pair of book-lungs usually have extra respiratory organs, known a tracheae, which are mostly situated just above the spinnerets. They open out on the ventral surface of the abdomen at the tracheal spiracles, also situated above the spinnerets towards the end of the abdomen (Fig. 2). The female external genital organ, known as the epigynum, is situated behind the pair of book-lungs in araneomorph spiders (Fig. 2) [In the mygalomorph spiders, this organ is lacking]. The epigynum is usually strongly sclerotised and often very complicated in structure. It opens in the middle of the epigastric furrow which is a groove across the anterior portion of the ventral surface of the abdomen (Fig. 2). In the male spider, the genital opening is not complex in form like that of the female and is very small and difficult to see without a microscope. Before mating, the male transfers his sperm from this opening into his palps and during mating into the female opening. The epigynum opening leads into internal vescicles known as spermathecae into

which the male deposits the sperm. The structure of the male palps and the female epigynum varies markedly from species to species and their morphology has been of great importance in the classification (taxonomy) of families and species. It appears that the two types of sexual organs act as a lock and key mechanism where only a male of one species is able to fit his palp into the epigynum of a female of the same species.

In most spiders, the spinnerets (or silk-producing organs) are situated at the posterior margin of the abdomen (Fig. 2). In form, they resemble fingers, pointing downwards and usually protruding beyond the abdomen; there are usually three pairs, the anterior, median and posterior pairs (named from front of the spider to the back). The median pair or middle pair of spinnerets are often very small and are composed of only a single segment and are thus usually completely obscured by the two other pairs. A spinneret may produce up to four or five different types of silk which are derived from different pairs of silk-producing glands within the abdomen. At the tip and/or along the inside edge of each spinneret are situated large numbers of tiny pores or tubules through which the silken threads are drawn out by the legs of a spider or is stretched out through the action of the spider when it free falls from resting post to resting post. In some families of spiders, known as the cribellate spiders [e.g. the families Desidae, Deinopidae and Uloboridae] there is an additional and special silk-producing organ known as the cribellum. This is a narrow oval plate which is situated between the various pairs of spinnerets. These spiders use a special comb or calamistrum on the metatarsus of each hind leg to comb out a broad band of tangled silk from the cribellum.

Behind the spinnerets and often hidden by them is a small hump with a short, transverse slit. This is the anus (Fig. 2) which is the posterior opening of the digestive system through which waste products and undigested matter are extruded to the outside environment.

Natural history

Life cycle

The generalised life cycle of a spider follows the pattern of an incomplete metamorphosis, i.e. this is a development which passes through only two intermediate and different stages, the egg and the spider. Although there are several to many moults (depending on the species) from the egg to the adult spider, the young spiders are only miniatures of the adults and even though they may be of different colouration to the adults, there are no marked morphological or structural differences between them. Compare this life cycle with that of beetles, wasps and some other insect orders which have a complete metamorphosis, where there may be three, four or more different stages in the life cycle and each stage differs significantly in structural, morphological and behavioural features.

Eggs and egg-sacs

The eggs of spiders vary significantly in shape, colour and size depending upon the species. They are usually laid inside an egg-sac which also varies depending on the type and species of spider. The eggs may be spherical to ovoid in shape, usually without surface ornamentations, and white, cream, yellow, orange, red, pink to pale brown in colour. They may be laid in a sticky mass (i.e. glutinous eggs) or arranged loosely or tightly packed together without any sticky secretion (i.e. non-glutinous eggs). The egg-sac may consist of a few to many silken strands covering the eggs to elaborate spherical egg-sacs with a dense mass of soft, fluffy silk inside which acts as padding for the eggs while a tough, waterproof and different coloured outer layer protects the inner soft layers and eggs from mechanical damage, desiccation and predation.

In most species, the female spider (and sometimes the male) rigorously guards the egg-sac from potential predators, often building a silken retreat over it in which the eggs and the female remain until the eggs hatch and the spiderlings later disperse. Other spiders may leave their egg-sacs unattended after the eggs have been laid; these egg-sacs are usually placed in concealed situations, such as under bark of trees, under stones and fallen logs and in rolled leaves and fallen pieces of bark and amongst other debris. Certain web-producing spiders leave the egg-sac unguarded but hanging inside the abandoned web, or against leaves and twigs of bushes and trees

at the outskirts of the web. The female Daddy-long Legs Spider [i.e. *Pholcus*, Pholcidae, Plates 13 and 14) holds and carries around in the chelicerae, a group of several eggs which are flimsily wrapped in only a few silken threads. The female Spitting Spider [i.e. *Scytodes*, Scytodidae, Plate 15) also carries the eggs around in a flimsy bundle held together under the body and abdomen. The females of Wolf Spiders (Lycosidae) are well-known for carrying their rounded, white to greyish-coloured egg-sacs under the abdomen with the use of the spinnerets (Plate 21).

Young spiders

The young spiders of most species usually hatch within a few weeks of the eggs being laid. When the young are about to hatch, the eggs become dark coloured due to the form and coloration of the spiderlings through the thin membranous egg-wall. The spiderlings of some species often remain in the egg-sac for a considerable period of time before emerging into the outside world. The spider's first moult usually takes place inside the egg-sac [and sometimes even in the egg itself] and an old or abandoned egg-sac will usually contain a large number of dried, shriveled, cast-off spider skins which are often mistaken for dead spiders or fragments of dead spiders. In those spiders which construct a strong, silken, protective covering over the eggs, the spiderlings remain inside the egg-sac until the female bites a hole in one end of the sac or the covering is weathered which weakens it and the spiders are able to chew their way out. Soon after the young spiders undergo their first moult, they are able to produce silk.

Parental brood care is common amongst spiders and the females of many species have been observed feeding the young spiders before they are old enough to leave the retreat and fend for themselves. When they are ready to leave the female and their egg-sac retreat, the young spiders wander slowly away or disperse by a method commonly known as ballooning. In this process, the young spider moves to the edge of a leaf or twig, and with its abdomen raised very high, releases a long, fine thread of silk from its body which blows around in a breeze or wind. Eventually enough thread is released so that the tiny spider is lifted from its resting post to be carried elsewhere for a new existence. In the case of spiders which burrow in the ground, e.g. Wolf Spiders (family Lycosidae) and Trap-Door Spiders (family Dipluridae), the young spiders simply crawl from the nest of the adult spider and dig small burrows nearby. In most cases, young spiders are miniature replicas of their parents but they may be much paler or differ slightly in coloration. The main differences between young and mature spiders (apart from obvious size differences) is that in the young spiders, the sexual/reproductive organs are not developed so that young males do not possess the typical enlarged palpal organs until fully grown. In addition, the young female spider does not possess an epigynum and so it is difficult and almost impossible to determine the sex of an immature spider.

One prominent feature of the life-cycle of a spider is the process of moulting which occurs periodically throughout the life of a spider. Depending on the species, a spider may moult 6-12 times during its growth. The period of time needed for a spider to reach maturity varies from species to species. In many small species, a spider may mature in 6-12 months but in many large spiders such as the mygalomorph families, a spider may mature in 2-3 years and may live upwards of 20 years!

Moulting occurs because the hard outer exoskeleton or integument of the spider does not allow gradual growth, hence the old "skin" has to be shed periodically and another one is produced. The spider passes into a quiescent stage a few days before each moult and displays little or no movement and does not feed. Some spiders undergo moulting by hanging downwards on a silken thread, while others attach themselves to twigs or leaves with a few silken threads. The old exoskeleton or skin is loosened by special moulting fluid secreted by the spider and it splits around the edges of the body resulting in the carapace peeling away. The spider them maneuvers, often with great difficulty, out of the old shell to remain quiescent while the new exoskeleton hardens. The spider is very soft and pale at this stage, the new skin taking up to a day to completely harden. Male and female spiders are only sexually mature after the last moult.

Courtship and mating

The male spider, after the last moult, usually abandons web-spinning or silk production and food capture and spends most of its time searching for a female of the same species for mating purposes. The main aim of the male is to mate with a suitable female. Most spiders possess very poor sight and females in particular may attack and kill any small spider, even individuals of their own species. Once a male spider has located a mate he is often in danger of being mistaken for a predator or potential meal/prey item for the female spider. Thus for survival, the male spider often produces a distinctive courtship ritual so that the female may recognize that he is a male of the same species. The courtship display also induces an awareness in the female that the male is mature and ready for mating and thus prevents the female from attacking him. In some families of spiders, the male first approaches and offers the female some food (as a peace offering!), such as a dead fly or other insect, and mates with her while the female is distracted and feeding on the prey offering! In the family Tetragnathidae (commonly known as the Four-jawed Spiders), the males possess two long teeth on the distal ends of the chelicerae which lock onto the fangs of the female to prevent the female from biting during mating. In a few spiders, mating occurs without any courtship by the male spider. This happens in most ground-inhabiting spiders and arboreal spiders living under or on bark of dead or live trees. In a few families, such as the Huntsmen Spiders (family Sparassidae), Crab Spiders (family Thomisidae), Wolf Spiders (family Lycosidae) and Funnel-web Spiders (families Hexathelidae and Dipluridae), the

male, when ready to mate, simply approaches the female, holds her in a tight grip and mates. These spiders may or may not have special spines which assist in holding down the female so that the male is not attacked and eaten before mating can take place. Before a male spider is ready to mate, he spins a very small sheet of web on which is deposited a droplet of sperm from the genital organs situated underneath the abdomen. This small web is known as the sperm-web and varies in size, shape and structure depending on the species. The male spider, once the sperm-web is complete, turns and scoops up the droplet of seminal fluid with the palps which are hollowed out and thereby adapted to hold sperm. This whole process is known as sperm induction. Once the male has successfully approached the female, he inserts the correct portion of the palpal organ into the epigynum of the female and the sperm is deposited and held in the female spermathecae. The palps may be inserted simultaneously or one at a time. Copulation may last for a few seconds to many minutes. The sperm is stored in the spermathecae for later fertilization of the eggs. The female is able to hold the sperm for considerable periods before she is ready to lay the eggs. Males usually die after having reached maturity and having mated, while many others are eaten by their female partners.

Diet and habitat

The reason why spiders have been so successful as a group and inhabit most known habitat types from the tropics to both polar regions, is that they possess many adaptations, especially in the adult stage. Depending on the species, spiders feed, almost exclusively, on living insect prey and are also partial to other spiders, whether they are the same species or not. It is difficult to generalise, since the diet of spiders varies considerably between the various families and even within genera or species of the same family. Since spiders vary considerably in size, depending on the species and sex (male spiders are often much smaller and sexually dimorphic in colour pattern), it is body size that is probably the main determining factor in the type of prey captured and consumed (at least in those spiders not constructing a web-snare of any kind). Most large net-building spiders such as from the families Argiopidae and Theridiidae feed on whatever is captured by their webs, such as grasshoppers, butterflies, wasps, moths, flies and beetles. Some small ant-mimicking spiders from the family Salticidae feed mostly on small ants which frequent the same habitat. The large Funnel-web Spiders (family Hexathelidae) and Trap-door Spiders (family Ctenizidae) and the Tarantulas (family Theraphosidae) are known to feed on vertebrates such as lizards and frogs (and even small birds!), as well as large ground-dwelling insects such as bush cockroaches and other spiders such as Wolf Spiders (family Lycosidae) and related species of mygalomorph spiders!

Spiders may be collected during the day or night under stones and fallen logs, in hollow tree-trunks of burnt or dying trees, and on the bark of living trees and shrubs, in caves,

on flowers and leaves of native and introduced shrubs, both in natural bushland and in residential gardens, in decaying compost heaps, in plant debris and in damp soil. Other ground-dwelling spiders inhabit sand, mud or gravel at the margins of freshwater creeks and rivers, waterbodies in caves, temporary pools of water in slow-moving creeks and rivers, or salt lakes.

Predators of spiders

Despite being predators themselves, spiders have many predatory enemies, such as certain mammals, birds, reptiles, wasps and centipedes. Man has also become, in essence, a predator of spiders through wanton destruction of their habitats and through poisoning by pesticides, insecticides etc. In addition to external predation, spiders are suspect to attack by parasitic flies, wasps and mantispids, which lay their eggs in the nests or egg-sacs of spiders. The parasitic larvae hatch before the eggs of the spiders and the parasites feed on the eggs, before developing into mature insects and leaving the egg-sac and nest to complete their life-cycles.

Classification of spiders

Taxonomy or classification is the branch of science which classifies all plants and animals according to their relationships. This system is very important because of the large number of species which need to be categorised and distinguished from their relatives. The classification of animals and plants is hierachial, with large groups of similar organisms being separated into more numerous smaller groups which are often further divided. The main taxonomic levels or ranks of the animal kingdom are, in descending order, Phylum, Class, Order, Family, Genus and Species. [Each level is subdivided but, for the purpose of this book, most of these subdivisions can be disregarded].

As an example, consider the classification of the spider *Isopeda insignis* (Thorell)(a Huntsmen Spider, one of the species described in this book):

Phylum: Arthropoda (jointed-legged invertebrates)
Class: Arachnida (8-legged arthropods)
Order: Araneida (spiders)
Family: Sparassidae (Huntsmen Spiders)
Genus: *Isopeda*
Species: *insignis* (Scientific name)

It should be noted that no two species of spider can have the same scientific name. The scientific name follows a binomial system, .i.e. there are two names, the first being the generic name and the second, the specific name. Trinomials (three-part names) are used in many animal groups, but discussion of these is beyond the scope of this book. Generic and specific names are italicised or underlined and a specific name always begins with a lower case letter, even if the species is named after a person or place. The name of the scientist (viz. biologist, taxonomist) who first described and named the species (the author) is attached to the end of the scientific name, e.g. *Isopeda insignis* (Thorell). This indicates that the spider was name by the arachnologist (i.e. a biologist specialising in the study of spiders) by the name of Thorell from Europe. The species was described in 1870 under a different generic name and was

later changed to the genus *Isopeda*. That is why Thorell's name is placed in brackets. Often the publication date (i.e. year) of the scientific name is included; it is placed after the name of the author, i.e. *Isopeda insignis* (Thorell, 1870).

Some spiders also have common names, i.e. English language names. Such spiders are usually common species or species which are distinctive in some way. Most spiders in Australia lack common names (and many are even without scientific names!). Although such common names are easier for the amateur to remember than the Latin or Greek derivative scientific names, they are unsatisfactory for several reasons. Firstly, they are not unique; it is possible for more than one species to have several common names. Secondly, they have no scientific validity- they are merely names which have come to be associated with the species by usage. And thirdly, common names do not indicate the relationships of a species in the way that scientific names do. In reference books, therefore, scientific names are usually used.

In general, the classification of families and species follows that presented in the Zoological Catalogue of Australia (Volume 3, 1985)(Australian Government Publishing Service, Canberra) but it should be stressed that this publication is a guide only. Since the Australian spider fauna is so poorly known both taxonomically and biologically and with much of what has been written previously dubious, highly debatable or simply erroneous, further detailed observations will inevitably change previous data and opinions.

Poisonous spiders

Of the 1800 known species of spiders so far described and named from Australia and off-shore islands, very few are of any danger or threat to humankind. Although most species possess effective and strong venom used in capturing live prey, they are usually timid and mostly try to escape if captured without biting or attacking, even if handled. In addition, most spiders are small and may not posses adequate quantities of venom to be of a dangerous threat and the chelicerae may not be strong or sharp enough to be of sufficient size to be able to pierce the human skin. Thus few spiders are capable of killing a human or even causing great pain and suffering. On the contrary, spiders are important to humankind's health, since they feed, as a whole, extensively on insect pests and other vermin. Such that the survival of most species should be encouraged in residential and rural areas.

The main spiders known to be a serious threat to humans in Australia are listed below and most of these are represented and discussed in this book:

Elassoctenus harpax (Ctenidae)
Loxosceles rufescens (Loxoscelidae)

Badumna insignis (Plates 1 and 2) (Desidae) (Black House Spider)
Lycosa species (Plates 16-21) (Lycosidae) (Wolf Spiders)
Chiracanthium species (Plates 32-35) (Clubionidae) (Garden Spiders)
Lampona cylindrica (Plate 41) (Gnaphosidae)
Olios species (Plates 71-74)(Sparassidae (Huntsmen Spiders)
Lactrodectus hasselti (Plate 125)(Theridiidae)(Red-back or Jockey Spider)
Aganippe species (Idiopidae) (Trap Door Spiders)
Misgolas (= *Dyarcyops*) species (Plate 165)(Idiopidae)(Trap Door Spiders)
Atrax formidabilis (Plate 139) and other species of *Atrax* (e.g. *A. robustus* and *A. infensus*) and *Hadronyche* species (Hexathelidae) (Funnel-web Spiders)
Idiommata (Plate 133) species (Barychelidae) (Trap Door Spiders)
Selenocosmia stirlingi (Plate 134) and *S. crassipes* (Theraphosidae) (Bird-eating Spiders)

Little is known about the toxic properties of many Australian spiders but it may be safe to say, that all large hairy spiders encountered should be treated with the utmost caution. If bitten by any spider, it is essential that the victim seek medical aid immediately and the spider be presented in a bottle, jar or plastic container for positive identification.

Species described in this book

NB. The information for each species of spider represented in this book is divided into the following categories: Description, Life history and habits, Habitat, Distribution and Photograph/Painting. These are self explanatory. A description is given of the main features for each spider species which may or may not be evident on the photograph/painting and also in most cases, only one of the sexes is shown. In the Distribution and Photograph/Painting sections, the abbreviations for the Australian States/Territories are as follows: Q= Queensland, NSW= New South Wales, V= Victoria, SA= South Australia, WA= Western Australia, NT= Northern Territory, T= Tasmania. Other country or islandic place names are given in full.

Desidae
- *Badumna insignis* (Koch, 1872)
- *Badumna longinqua* (Koch, 1867)

Deinopidae
- *Deinopis subrufa* Koch, 1879

Uloboridae
- *Uloborus barbipes* Koch, 1879
- *Uloborus geniculatus* (Olivier, 1789)
- *Uloborus congregabilis* Rainbow, 1916

Pholcidae
- *Pholcus phalangioides* (Fuesslin, 1775)

Scytodidae
- *Scytodes fusca* Walckenaer, 1837

Lycosidae
- *Lycosa bicolor* Hogg, 1905
- *Lycosa godeffroyi* Koch, 1865
- *Lycosa leucophaeoides* (Roewer, 1951)
- *Lycosa tula* (Strand, 1913)
- *Hogna senilis* (Koch, 1877)

Dysderidae
- *Dysdera crocata* Koch, 1838

Oxyopidae
- *Oxyopes elegans* Koch, 1878
- *Oxyopes quadrifasciatus* Koch, 1878

Zodariidae
- *Storena formosa* Thorell, 1870
- *Storena annulipes* (Koch, 1867)
- *Storena maculata* O. Pickard-Cambridge, 1869
- *Zillimata scintillans* (O. Pickard-Cambridge, 1869)

Clubionidae
- *Clubiona robusta* Koch, 1873
- *Clubiona modesta* Koch, 1873
- *Clubiona elaphines* Urquhart, 1893

Miturgidae
- *Cheiracanthium gracile* Koch, 1873
- *Cheiracanthium gilvum* Koch, 1873
- *Cheiracanthium diversum* Koch, 1866
- *Miturga agelenina* Simon, 1909
- *Miturga lineata* (Thorell, 1870)

Corinnidae
- *Corrinomma suaverubens* Simon, 1896
- *Supunna albopunctum* (Hogg, 1896)
- *Supunna picta* (Koch, 1873)

Lamponidae
- *Lampona cylindrata* (Koch, 1866)

Gnaphosidae
- *Rebilus castaneus* Simon, 1908

Hersiliidae
- *Tamopsis fickerti* (Koch, 1876)

Salticidae
- *Astia hariola* Koch, 1879
- *Astia nodosa* Koch, 1879
- *Bavia ludicra* (Keyserling, 1882)
- *Breda jovialis* (Koch, 1879)
- *Helpis minitabunda* (Koch, 1880)
- *Holoplatys bicolor* Simon, 1901
- *Jotus auripes Koch*, 1881
- *Menemerus bracteatus* (Koch, 1879)
- *Myrmarachne striatipes* (Koch, 1879)
- *Ocrisiona elegans* (Koch, 1879)

Ocrisiona leucocomis (Koch, 1879)
Opisthoncus necator Keyserling, 1881
Opisthoncus machaerodus Simon, 1909
Opisthoncus polyphemus Koch, 1867
Pystira orbiculata (Koch, 1881)
Servaea vestita (Koch, 1879)
Sigytes scutulata (Keyserling, 1881)
Simaetha tenuideus (Keyserling, 1883)

Sparassidae (Heteropodidae)

Delena cancerides Walckenaer, 1837
Heteropoda cervina (Koch, 1875)
Isopeda immanis (Koch, 1867)
Isopeda insignis (Thorell, 1870)
Isopeda villosa Koch, 1875
Olios diana (Koch, 1875)
Olios salacius (Koch, 1875)
Olios sp.
Pediana regina (Koch, 1875)

Thomisidae

Cymbacha cerea Koch, 1876
Cymbacha festiva Koch, 1874
Cymbacha ocellata Koch, 1874
Cymbacha saucia Koch, 1874
Diaea evanida (Koch, 1867)
Diaea pilula (Koch, 1867)
Diaea variabilis Koch, 1875
Hedana gracilis Koch, 1874
Isala punctata Koch, 1876
Poecilothomisus speciosus (Thorell, 1881)
Runcinia acuminata (Koch, 1874)
Sidymella hirsuta (Koch, 1873)
Sidymella lobata (Koch, 1874)
Stephanopis barbipes Keyserling, 1886
Stephanopis altifrons O.Pickard-Cambridge, 1869
Stephanopis ornata Koch, 1875
Tharpyna albosignata Koch, 1876
Tharpyna campestrata Koch, 1874
Thomisus spectabilis Doleschall, 1859
Xysticus bilimbatus Koch, 1867
Xysticus geometres Koch, 1874

Araneidae

- *Arachnura higginsi* (Koch, 1872)
- *Archemorus curtulus* Simon, 1893
- *Arcys cornutus* Koch, 1871
- *Arcys lancearius* Walckenaer, 1837
- *Argiope aetherea* (Walckenaer, 1837)
- *Argiope extensa* Rainbow, 1897
- *Argiope trifasciata* (Forskoel, 1775)
- *Celaenia kinbergi* Thorell, 1868
- *Cyclosa bacilliformis* Simon, 1908
- *Cyclosa bifida* (Doleschall, 1859)
- *Cyclosa trilobata* (Urquhart, 1885)
- *Cyrtophora exanthematica* (Doleschall, 1857)
- *Cyrtophora hirta* Koch, 1872
- *Cyrtophora moluccensis* (Doleschall, 1857)
- *Dicrostichus furcatus* (O.Pickard-Cambridge, 1877)
- *Dicrostichus magnificus* Rainbow, 1897
- *Eriophora bradleyi* (Keyserling, 1887)
- *Eriophora circulissparsus* (Keyserling, 1887)
- *Eriophora parvulus* (Rainbow, 1901)
- *Eriophora praesignis* (Koch, 1871)
- *Eriophora transmarina* (Keyserling, 1865)
- *Gasteracantha fornicata* (Fabricius, 1775)
- *Gasteracantha minax* Thorell, 1859
- *Gasteracantha quadrispinosa* O.Pickard-Cambridge, 1879
- *Gasteracantha taeniata* (Walckenaer, 1837)
- *Gasteracantha westringi* Keyserling, 1863
- *Leucauge dromedaria* (Thorell, 1881)
- *Nephila edulis* Koch, 1871
- *Nephila ornata* Rainbow, 1896
- *Phonographa graeffei* (Keyserling, 1865)
- *Phonographa melania* (Koch, 1871)
- *Poecilopachys bispinosa* (Keyserling, 1865)
- *Poltys laciniosus* (Keyserling, 1865)

Tetragnathidae

- *Tetragnatha demissa* Koch, 1872
- *Tetragnatha luteocincta* Simon, 1908

Theridiidae

- *Achaearanea tepidariorum* (Koch, 1841)
- *Ariamnes colubrinus* Keyserling, 1890
- *Argyrodes antipodianus* O.Pickard-Cambridge

Argyrodes sp.
Conopistha sp.
Lactrodectus hasseltii Thorell, 1870
Nicodamus bicolor (Koch, 1872)
Theridion extrilidum Keyserling, 1890
Theridion mortuale Simon, 1908
Theridion pyramidale (Koch, 1867)
Theridion sp.

Barychelidae
Idiommata sp.

Theraphosidae
Selenocosmia crassipes (Koch, 1874)
Selenocosmia stirlingi Hogg, 1901

Actinopodidae
Missulena bradleyi Rainbow, 1914
Missulena granulosa O. Pickard-Cambridge, 1869
Missulena insigne (O. Pickard-Cambridge, 1877)

Dipluridae
Cethegus fugax (Simon, 1908)

Nemesiidae
Aname tepperi (Hogg, 1902)

Hexathelidae
Atrax formidabilis Rainbow, 1914
Atrax robustus O. Pickard-Cambridge, 1877

Idiopidae
Arbanitis variabilis (Rainbow & Pulleine, 1918)
Misgolas robertsi (Main & Mascord, 1974)

Ctenizidae
Conothele arboricola Pocock, 1899

Family **Desidae**

(Australian species: about 50; World species: about 180)

This family contains mainly small to medium-sized dark-coloured spiders, measuring usually less than 20 mm long, with short, prominently spherical to ovoid abdomens, and like the family Uloboridae (see later), they possess a cribellum and calamistrum. Most species construct irregular sheet webs; each sheet consists of several parallel to radially-arranged silken threads between which are numerous cross-threads arranged in a zig-zag to wavy pattern. In the broad sense, there are about 17 genera of this family represented in Australia with the genus *Badumna* being the largest

with about 18 species. This family, as presently circumscribed, is mostly found in New Zealand where there are many small endemic genera.

Badumna are mostly moderate-sized, usually black to dark brown spiders covered in white, grey or pale brown hairs; they are mostly active during the night. During the day they hide amongst their dense, tangled web amongst foliage or bushes and trees or within crevices in and under houses or under wood, sheet metal etc., lying around on the ground. Their webs are often littered with the remains of numerous flies, beetles, grasshoppers and other insects which become caught in their webs and are vigorously eaten by the occupants. *Badumna socialis* (Rainbow, 1905) is a moderate-sized, hairy spider living in sandstone and limestone caves in New South Wales; it has a dark brown cephalothorax and a yellowish-brown abdomen. It produces extensive shawl-like and densely woven webs measuring up to 2 or 3 metres in diameter on the roofs of the caves. The webs are typical of that of the family in that there are a large number of holes or entrances to retreat tubes in which the spiders rest. The females produce a number of flattened, disc-shaped, whitish egg-sacs which are scattered randomly over the cave walls; they each measure about 7-8 mm in diameter. The eggs and early life-stages are unknown and have not been described. Other species of *Badumna* construct a nest of bundles of sticks and leaves, together with silk in trees and bushes, at the centre of which is a very dense mass of silk, displaying a number of rounded entrances/exits of tunnels in which the spiders rest during the day. From the central silken mass, which acts as a home for a colony of spiders, a large number of irregular, silken networks spread outwards to the outskirts of the colonial nest. Some species of *Badumna* are solitary and do not build a colonial nest. Various species of book lice (Psocoptera: Insecta) have been found in the nests of *Badumna* (*Phryganoporus*) *candida* (Koch, 1872) and many of these appear to be host specific.

Members of the endemic genus *Paramatachia*, of which there are about 5 described species represented in eastern Australia, build irregular sheet webs which usually extend from natural crevices such as holes in the thick bark of certain trees or may be attached to twigs and branches. The web is usually characterized by having several parallel strands with connecting zig-zag strands between them. Little has been recorded on the biology and habits of the various species of *Paramatachia*, a genus which is also represented in Tasmania. These spiders are mostly small, brownish arachnids with white markings and darker patches on the abdomen, and the first pair of legs are much longer than the remaining three pairs.

Colcarteria is a newly described endemic genus of three species from northern New South Wales, of which at least two species live in caves inhabited by native bat species. Other habitats for these spiders include niches under rotting logs in moist forests. They construct small sheet-webs with two or three entrances at ground level. In caves, their webs are constructed within dark to partially illuminated areas amongst rocks and guano/debris on the cave floor.

The genus *Badumna* is represented by two species in this book.

  (Plate 1 & 2)

Badumna insignis (Koch, 1872)

Description: Body dull black or dark grey-brown, with the abdomen black or with a few small, white spots and darker brown/black markings. Males are slightly smaller than the females and have longer legs. Body length: 10-12 mm (males); 16-20 mm (females).

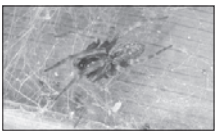
Life history and habits: Commonly known as the Black House Spider, the Window Spider or less commonly, and inaccurately, the "Funnel-Web Spider". This species has an Australia-wide distribution and as its vernacular name suggests, is found most commonly around houses in residential areas. It is particularly common in eastern Australia. The females usually build their webs in the corners of buildings, rooms and windows, under window-sills, in sheds and telephone boxes, and in other outdoor structures, preferably over a crack or crevice into which the spider can retreat if disturbed. In natural habitats, the spider is found under logs, rocks and stones, under loose bark of trees and under cliffs, usually in dry situations. The web consists of a tubular retreat which spreads out in a series of one or more broad funnels (hence the other vernacular name); these funnels sometimes spread out into extensive curtain-like sheets measuring up to 35 cm from the tubular retreat. The curtain sheets consist of numerous radiating and tangential threads, between which are usually zig-zag threads which are analogous to the girders of a steel bridge. The spider usually repairs or makes extensions to the web at night. In doing so, the spider moves slowly amongst the outskirts of the web, combing out threads of cribellate silk which is arranged in a zig-zag pattern at the edges or across any broken portions of the old web. These old webs assume a dense, tangled and greyish appearance and the zig-zag patterns of silk of newly woven webs are obscured. The female spider constructs a white, silken, flat and slightly concave egg-sac which is usually sheltered at the back of the web, often in a crevice into which the female retreats if disturbed. The spiders are mostly nocturnal and feed on a wide variety of insects, such as flies, soft-bodied beetles and moths. The webs are often littered with the remains of insects after the spiders have finished sucking out the juices of their prey. During summer, the males visit the webs of the females at night for mating purposes. Much care should be taken when handling this spider as the fangs are capable of penetrating human skin and the poison is toxic enough to cause extreme pain and suffering. One published record by R. Mascord noted various symptoms of a bite from this spider to a person bitten on the hand; this person suffered swelling and localised pain, which was accompanied by profuse sweating, shivering and weakness in the limbs and muscles; these symptoms were followed by semi-consciousness and nausea. The sweating and feelings of weakness

were reported as continuing for several days, after which time it slowly diminished, while the sweating continued for 6 days before subsiding. The person also suffered for several months with a badly ulcerated hand. This is indeed a toxic and dangerous spider to humans and it should be respected and given the necessary caution. However, despite their abundance and widespread distribution throughout Australia, they are usually very secretive spiders and hide during the day amongst their webs and are seldom encountered by the casual observer. They should be left alone as they are, despite their toxicity to humans, very useful in controlling garden and household pests such as flies, mosquitoes and other flying insects.

Habitat: Woodlands, dry sclerophyll forest, residential areas.

Distribution: Q, NSW, V, SA, T, WA, NT and various small islands off the Australian mainland.

Photographs: Plate 1, Toowoomba, Q; female: 17 mm body length. Plate 2, Brisbane, Q; female: 18 mm body length (Two photos showing variation in abdominal pattern).



(Plate 3)

Badumna longinqua (Koch, 1867)

Description: Legs and underside of the body brownish-black to dull black with scattered white to grey hairs, denser on the legs; cephalothorax dull brown to black with whitish hairs; abdomen grey-brown, darker brown to dull black, with dorsal white and black flecks, and with usually median dorsal dark brown to black, transverse/longitudinal marks. Males are similar to the females but have narrower and smaller abdomens. Body length: 8-10 mm (males), 10-15 mm (females).

Life history and habits: This is a widespread and common species throughout eastern Queensland. They construct their webs and retreats in crevices in buildings, houses, sheds and under large rocks and more commonly also amongst low foliage in gardens near the retreats of other spiders of the same species inhabiting walls etc. They are mostly nocturnal and usually emerge from hiding near or just before dusk to sense the environment and to seek prey. On hot days during summer, the adults usually emerge from their retreats to move to cooler situations or they may rest outside the retreats awaiting the cooler afternoon and evening. The female constructs an untidy mass of silken threads as a web and retreat measuring up to 20 cm or more in diameter, attached to various supports and enclosing a papery, white egg-sac measuring about 5-8 mm in diameter. The egg-sac is usually positioned at the back of the web or amongst foliage and web where it is well camouflaged and protected. Each egg-sac contains about 100-180 globular, non-glutinous, off-white eggs measuring about 0.8-1.0 mm in diameter. The adults feed on a wide variety of

insects including small beetles, flies, flying termites, moths and bugs, while in north Queensland, their food is reported to consist mostly of green tree ants (*Oecophylla smaragdina*, family Formicidae: Hymenoptera).

Habitat: Heathlands, dry sclerophyll forests, woodlands and especially residential areas adjoining these habitats.

Distribution: Q.

Photograph: Brisbane, Q.; female: 13 mm body length.

Family **Deinopidae**

(Australian species: 13; World species: about 60)

This is perhaps the most remarkable family of the spider order because of their extraordinary behaviour of capturing their prey by casting a silken net over them. Most spiders construct a sticky web and wait for the prey to walk, fall or fly into it thereby being captured. Because of these habits, the Deinopidae are commonly known as Net Casting Spiders. They occur mainly in the warm to hot tropical and sub-tropical regions of the world. The family is represented in Australia by only 2 genera, *Deinopis* (7 species) and by *Avella* (= *Menneus*)(6 species), the latter genus being less common and not so well-known. In general, Deinopidae are large, slow-moving spiders with stick-like legs (hence another common vernacular of Stick Spider for the group). These legs are very long in relation to the rest of the body and are thin with straight segments which are irregularly thickened near the joints. Deinopids have narrow bodies which are coloured various shades of brown and grey; in some species the abdomen may have a marbled pattern or be adorned with dark longitudinal bands. The abdomen of most deinopids have two dorsal tubercles and can measure up to 6 times longer than wide. The carapace in some species may have a white median stripe. Members of the genus *Deinopis* are usually very widespread, occurring in woodlands and sclerophyll forests throughout Australia and Tasmania.

The genus *Deinopis* is represented in this book by the most common and widespread species, *D. subrufa* Koch.



(Plates 4-9)

Deinopis subrufa Koch, 1879

Description: Male- body grey-brown to grey on the dorsal surface; legs grey to grey-brown with darker brown bands; anterior posterior eyes very large, black. Female- body and legs mostly orange-brown, buff-brown, grey-brown or darker brown, with long

legs banded in darker orange-brown or brown; the posterior half of the dorsal surface of the abdomen is usually darker in colour. Apart from colour and size differences, the male differs from the female in having a more slender abdomen, slightly longer legs and in having lighter stripes bordering the carapace and abdomen. Body length: 12-18 mm (males), 20-25 mm (females).

Life history and habits: Commonly known as the Net-Casting Spider, Ogre-faced Spider or Stick Spider. This is a nocturnally active spider which is often common in suburban gardens throughout Australia.The adults rest during the day amongst low foliage, branches and twigs with their posterior legs pressed close to the body, while the first two pairs, which are held together, are extended forwards. In this position they are well camouflaged. At dusk the spiders become active and construct a small, but elaborate, rectangular, expandable sheet of cribellate silk which is held between the four anterior tarsi of the two pairs of front legs. When holding her net, which measures about 25-30 mm in length, the spider hangs its head downwards, and is suspended by the tarsi of the remaining legs from non-sticky threads. Whenever an insect or similar prey approaches closely, the spider stretches the net tightly with the forelegs and lurches forward and downwards, at the same time throwing the net over the victim; the more the prey struggles, the more it becomes entangled; while it is struggling, the spider wraps the net around it. The victim is eaten through the net or its silk wrappings. A second net may be constructed while the spider is feeding on the newly captured prey. The male also builds nets until he is sexually mature, whereupon he usually abandons net casting and feeding, and instead, devotes most of his time in finding a mate. Upon seeing a female, the male rests close to her for a long time before mating. He courts the female by jerking on a silken thread which is connected to the scaffolding of her net. Soon after fertilization takes place, the male dies. Later the female constructs a spherical egg-case, of very strong brown silk, which is suspended on strong silken threads measuring 3-5 mm long. The egg-case is globular in shape, 10-12 mm in diameter and is pink-brown to pale brown in colour, with dark brown to black specks; it is also smooth to slightly rough in texture with a thick watertight covering. Inside the egg-sac is soft white silk laid down as a single thread measuring up to 5 metres long, which acts as padding for the eggs. The egg-sac contains 120-220 non-glutinous, spherical, pale green-coloured eggs, each measuring 1.5-1.8 mm in diameter. After completing the egg-sac, the female secures it to a twig or large branch of a tree or shrub and leaves it unattended. It is usually covered with a few dead leaves and other debris for camouflage. After hatching through a hole near the top of the egg-sac, the spiderlings spin a few strands of fine web and live gregariously for up to three weeks before dispersing and living a sedentary existence until sexual maturity. Mature spiders feed on a wide variety of flying insects such as moths, flying termites and mosquitoes.

Habitat: Heathlands, woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, NT, WA, SA, T.

Photographs: Plate 4, Brisbane Q; male resting on silken threads in residential garden, 14 mm body length; Plate 5, Brisbane, Q; head of male showing large posterior median eyes; Plate 6, Brisbane, Q; gravid female resting on silken threads in residential garden, 24 mm body length; Plate 7, Brisbane, Q; female resting on silken thread in residential garden (also showing variation in colour pattern); Plate 8, Brisbane, Q; egg-sac, camouflaged with dead leaves, 11 mm in diameter; Plate 9, Brisbane, Q; egg-sac opened to show the eggs inside and the white silken padding, much of which has been removed for photographic purposes.

Family **Uloboridae**

(Australian species: 10: World species: about 240)

This is rather an interesting family because the spiders of this group have no poison glands like other spiders. However, unlike most spiders, they possess a comb (i.e. the calamistrum) on the metatarsum of each of the last pair of legs, and are provided with a broad, silk-producing plate (the cribellum) in front of the spinnerets. These organs are also represented in several other spider families, but of these, the Uloboridae is the only one which builds orb webs. These webs are usually constructed in sheltered places such as in hollow tree-trunks and large branches and under rock-ledges in natural habitats and in corners of verandahs and fences and in other sheltered areas on buildings, sheds and in gardens in residential areas. The webs are usually positioned close to the ground to which they are often attached. The spiders rest on the underneath of the web with their legs stretched out and drop to the ground on a silken thread if disturbed. The silk produced by these cribellate spiders tends to be bluish in colour, so that a distinctive bluish orb web observed by any naturalist in the field, is most likely to have been constructed by a member of this family. Characteristically, the orb web is not positioned upright as is the case with other orb-weaving spiders, but is oblique or longitudinal and often supported by an untidy-looking mass of threads above and below the orb. The spiral threads of the web often have an undefined, shabby appearance and old webs in particular, look quite "woolly" as a result of the accumulation of the tangled threads. The appearance of this type of web is a certain indication that it belongs to an uloborid spider.

Most uloborids are solitary but a few species prefer to live in colonies in which there may be several spiders (of the same species) sharing a large mass of threads with a few poorly constructed orb webs suspended in the centre. In these cases, the web is adorned with several dead leaves, twigs and pieces of other debris in order to camouflage the inhabitants.

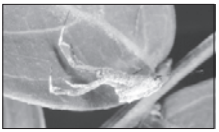
There are at least 4 genera represented in Australia, namely *Uloborus* (with about 5 species), *Miagrammopes* (3 species), *Miagrammopsidis* (monotypic) and *Ranguma* (1 species). The

classification of the family is far from being satisfactory and other Australian species await description.

Uloborus are commonly called Humped Spiders because the abdomen is usually markedly triangular in side view, humped or projected forwards and sometimes with one or more pairs of tubercles on the extremities. They are small to medium-sized spiders, usually drab brown to grey in colour. However, when closely examined, some species also show attractive striping, with patterns of white, black, grey, brown or yellow hairs. The genus is represented throughout the moist areas of Australia with one species, *Uloborus geniculatus* (Olivier, 1789) commonly found in residential areas across the continent. *Uloborus* are sedentary spiders and rest with their legs outstretched in the centre of the web. Their papery egg-sacs are ovoid, disc-shaped or resemble a dried leaf; they are coloured white, light brown or light purple-grey.

Little is known of the habits and distribution of *Miagrammopes*, which are known from Queensland and New South Wales only. They are apparently rare, small, dark brown to green spiders with prominently elongated abdomens and distinctive front legs which are long and stout. *Miagrammopsidis flavus* Wunderlich, 1976 is a small, pale-coloured, poorly known species from the Cairns district, north-eastern Queensland. *Ranguma lehtineni* Wunderlich, 1976 is a small, rainforest-inhabiting species from the McPherson Range, south-eastern Queensland.

Three species from the genus *Uloborus* are represented in this book.



(Plate 10)

Uloborus barbipes Koch, 1872

Description: Body creamy brown with darker brown and grey markings; anterior legs very long with tufts of hairs towards the distal end. Males are similar in colour pattern but are slightly smaller than females and have a much narrower abdomen. The colour pattern is variable with immature specimens much paler in colour than the adults. Body length: 4-5 mm (males); 5-6 mm (females).

Life history and habits: Commonly known as the Hairy-legged Hump Spider, because of the hair tufts of the first pair of legs. These spiders construct a small orb web amongst low-growing bushes or foliage near the ground and is often fastened to the ground. The orb web is usually placed horizontally or inclined obliquely. The spider also nests in sheltered places such as in tree trunks, under rock ledges and under partially fallen logs. The web usually has a hackled, untidy and undefined appearance (especially older ones). The spiders are usually very difficult to detect

because they are drab in colour and merge in with the background and also they rest motionless with their legs outstretched and they resemble a piece of bark or a twig caught in a web. After mating the mature female constructs an irregular, oval-shaped to rhomboid egg-sac measuring about 6-8 mm long and 4-5 mm wide. It is composed of greyish-white silk which discolours in a short time and becomes contaminated with dust, small pieces of bark and other debris. The egg-sac contains 40-50 non-glutinous, pinkish-coloured, globular eggs, each measuring about 0.5 mm in diameter. After hatching, the spiderlings remain with the sac and web until the first moult. Mature spiders feed on a wide range of small, soft-bodied insects such as flies, mosquitoes, flying termites and moths.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW.

Photographs: In a residential garden in Brisbane, Q.; male: 5 mm body length.

 (Plate 11)

Uloborus geniculatus (Olivier, 1789)

Description: Cephalothorax dark grey-brown with variable whitish patches; abdomen not as humped as in other uloborid spiders, greyish-white to white, the upper portion near the cephalothorax dirty-white to grey, the apical half of the abdomen being mostly dark grey to grey-brown, with or without grey to whitish spots or marks; legs grey-white with variable amounts of dark brown to black banding. The colour pattern on the abdomen is variable but the spider can be easily identified by the very long and prominently banded front pair of legs. Body length: 4-5 mm (males), 6-8 mm (females) with colour pattern of the male similar to that of the female. Immature specimens are much paler in colour.

Life history and habits: This is a cosmopolitan species usually found in association with humans in the warmer regions of the world. Spiders are often gregarious or solitary and found in sheltered, dry situations in and under houses, sheds, amongst dry stacked wood etc. Females build a small orb web, usually symmetrical or obliquely inclined. The egg-sac measures 8-10 mm in diameter, is lens-shaped, papery in texture and is pale purple or darker in colour when newly constructed but darkens to a dull brown or grey-brown shade with age; it is flat, irregular to star-shaped and is usually attached to the upper part of the web.

Habitat: Residential areas.

Distribution: Q, NSW, WA, NT.

Photograph: Under a house at Tweed Heads, NSW; female: 10 mm body length.

(Plate 12)

Uloborus congregabilis Rainbow, 1916

Description: Body and legs grey to dark chocolate-brown, often with lighter markings on the dorsal surface of the abdomen and sides; abdomen with a large and prominent tuberculate projection with two points at the apex. The colour pattern of the species is very variable. Males are similar in colour pattern to the females but are smaller with a rather flatter, cylindrical abdomen which has about four tubercles on the dorsal surface. Body length: 3.0-3.5 mm (males); 4.5-6.0 (females).

Life history and habits: Commonly known as the Communal Uloborid Spider because often relatively large numbers of these spiders construct webs close together so that they form a close-knit community of spiders. They are usually found in houses and sheds where they prefer dark, dry, sheltered areas for their web-snares, while other spiders live in natural habitats where they are mostly found in cool, sheltered situations. Whether in buildings or in native habitats, the species is almost invariably found dwelling together in large or small communities, making a common web which consists of intricate, small orb-webs and delicate intertwining threads. The spiders mature in late summer to autumn and each female constructs an irregular, flat, elongate, dark greyish-brown to dark brown egg-sac with prominent extensions on the sides. It measures 6-12 mm long. The female closely guards the egg-sac by resting at one end. Together, their cryptic coloration gives them ample camouflage and in native habitats they are particularly difficult to see; they resemble a piece of stick, twig or other debris. The egg-sac contains 15-30 non-glutinous, pink-coloured eggs, each measuring about 0.3-0.4 mm in diameter. The young spiders hatch within a few weeks and are dark grey in colour. They remain with the female until a late stage when they either add to the colony or move to form new ones. The mature spiders feed on a wide variety of small, soft-bodied insects such as flies and mosquitoes which become caught in their snares.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: NSW.

Photograph: In a residential garden at Nimbin, NSW; female (5 mm body length) with remains of egg-sac and the newly emerged spiders.

Family **Pholcidae**

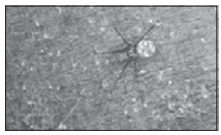
(Australian species: about 12: World species: 780)

This large, cosmopolitan family, which is found mostly in the warmer areas of the world, contains distinctive, small, fragile spiders with very long thin legs. Their abdomens are also very

long and cylindrical, usually drab yellow to greyish-brown in colour. They are commonly called Daddy-long Legs Spiders because of their legs. They are mainly secretive spiders and live in dark sheltered places. They usually have eight eyes, although this number is reduced to six in some species and in some cave-dwelling species, the eyes may be prominently reduced in size or be absent altogether. When disturbed, they usually undergo an unusual defense behaviour; they begin to rotate and gyrate their bodies round and round, usually describing circles from right to left; they move so rapidly that their bodies often appear as a blur. Pholcids construct delicate webs in discarded boxes, wine cellars, under houses and verandahs and in other sheltered positions; in their native habitats they frequent caves and hollow tree-trunks. When resting in the web, they invariably hang body downwards or occasionally they may be detected resting in a vertical position, in which case, the head is positioned downwards. Unlike most spiders, the females of this family, do not produce egg-sacs. Instead, the female wraps a loose covering of a small number of silken threads around the egg cluster which is held in position in the spider's chelicerae and is carried around until the eggs hatch.

There are 9 genera in Australia, most of which contain a single representative species. *Pholcus*, the type genus, is represented by the cosmopolitan *P. phalangioides* (Fuesslin, 1775), which is found throughout most of Australia and Tasmania to where it has most probably been introduced from Europe; it appears most certain that it has been introduced into Western Australia from the eastern States. Another species, *P. anchoralis* Koch, 1872 is smaller than *P. phalangioides* and occurs mostly in north-eastern Queensland and various islands of the Great Barrier Reef and has also been recorded inhabiting scrub and rocky ledges in sheltered coastal bushland in central New South Wales. It was originally collected and described from Samoa. *Pholcus littoralis* Koch, 1867 is a native species from coastal Queensland ranging from Cape York to Brisbane but nothing has been recorded on its biology and behaviour. *Trichocyclus* is a monotypic genus from the semi-arid districts of central Western Australia. Nothing appears to have been written on its only species, *T. nigropunctatus* Simon 1908, since it was first collected from Yalgoo near the turn of the 20th century. *Psilochorus* is represented by one native species, *P. sphaeroides* (Koch, 1872) which occurs in the Northern Territory and north-eastern Queensland from Cape York to about Cairns. It is a very long, cylindrical spider, the body being about 8 mm long and about 1.5 mm wide; its legs are incredibly long and thin. The female carries its eggs in a single row in front of her and are held together by silken threads. Another species, *Micromerys daviesae* Deeleman-Reinhold, 1986, has recently been described from north-eastern Queensland. *Micromerys gracilis* Bradley, 1887, is a very slender, greenish spider from northern Queensland in which the female carries her eggs in a short line in front of her. These eggs are held together by thin silk and are large in relation to the spider's body. This spider has been recorded feeding on green tree ants (*Oecophylla smaragdina*, family Formicidae: Hymenoptera).

The family is represented in this book by the most common species of *Pholcus* in Australia, the Common Daddy-long Legs.



(Plates 13 & 14)

Pholcus phalangioides (Fuesslin, 1775)

Description: Body yellow-brown to grey with yellow-grey, dark grey to black legs; abdomen cylindrical, 2-3 times longer than wide, legs up to 50 mm long without spines; males have teeth on the anterior margins of the chelicerae; body length 5-6 mm (males), 7-8 mm (females); males have more slender bodies and longer legs than the females.

Life history and habits: Commonly known as the Daddy Long-legs Spider. This is probably the best known Australian spider, especially so to children and housewives. They are invariably associated with human habitation and occur in garages, sheds, empty boxes, under verandahs, in cellars, attics, behind doors and other dark enclosed places. It also commonly occurs behind cupboards etc, in homes and is often unnoticed by cleaners since the webs are very thin and the spiders are cryptically coloured. In native habitats, the spiders occur in caves and in hollow logs and trees. During the winter, the spiders rest, tightly pressed and motionless, against the underside of wood or other material in their hideouts. In spring, with the onslaught of warmer weather, they become active and build their snare webs which consist of a tangle of irregular, soft, silken threads. Sometimes these webs may be represented by a tangled sheet of up to about 30 cm in diameter. The spider always remains in the centre of the web, where it is suspended upside down and from where it captures moving prey nearby. *Pholcus* spiders appear not to use their webs to capture prey directly but the web acts as a kind of scaffold upon which the spider is held in position while it throws some silk over unsuspecting small moths and other insects. *Pholcus phalangioides* has also been recorded feeding on garden slaters (these are land crustaceans which live in damp places under houses, timber, refuse, scrap metal etc.). Daddy Long-legs spiders usually mature in the summer when mating also takes place. After mating, the females produce a glutinous mass of whitish eggs which are held together with only a few thin strands of silk. This fragile mass is carried around by the female in her chelicerae until the eggs hatch. After the new spiderlings emerge, they rest for a few days in the web with the female and after the first moult, they leave to fend for themselves.

Habitat: Residential areas, dry sclerophyll forests and woodlands.

Distribution: NSW, V, Q, NT, WA, SA, T, Europe and the United States (usually more common in warmer regions of its range where the temperature throughout the year does not drop below 10°C).

Photographs: Plate 13: female (7.5 mm body length) resting with legs outstretched in a sideways position against a piece of wood underneath a

house in Brisbane, Q, Plate 14: female (7 mm body length) carrying a bundle of newly laid eggs, Brisbane, Q.

Family **Scytodidae (Sicariidae)**

(Australian species: 6; World species: about 120)

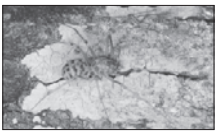
This small family of unusual spiders is represented in Australia by about 6 species, at least 3 of which are endemic, and one, *Scytodes perfecta* Banks, 1898 which has been introduced from the Americas, is now more common in eastern Australia. Little is known of the biology and behaviour of the endemic species.

They are commonly known as Spitting Spiders because of their unique habit of capturing prey. When they move close to a potential victim, the spider suddenly squirts out a stream of sticky, poisonous liquid from its fangs, which sticks or glues the prey to a wall, ceiling or other substrate upon which it has been resting or moving. Soon after, the spider bites and eats the prey. The substance ejected reaches the prey as two jets of zig-zag bands. In order to achieve this feat, the spiders fangs are moved quick from side to side during the squirting process; but this rapid oscillation is too quick for the human eye to detect. The sticky secretion is produced from poison glands situated in the upper high part of the cephalothorax.

Scytodes thoracica (Latreille, 1802) [previously confused with *S. perfecta* Banks, 1898 from Europe] is a widespread spider which occurs Australia-wide. They, like most spiders from the previously described family Pholcidae, are usually associated mostly with human habitation. The adult spider measures 4-6 mm in body length (males are slightly smaller than the females); the body is translucent, yellowish or cream in colour with dark brown to blackish-brown spots on the body and legs. The legs are very slender and spindly in relation to the rotund body and because of this unbalanced weight, the spider is unable to walk very fast; instead, it creeps along slowly in search of small prey such as soft-bodied flies, mosquitoes and silverfish, which are often common in houses. The cephalothorax is distinctive in being prominently arched towards the back and the abdomen, and slopes downwards to the chelicerae. The spider has six eyes, grouped in three pairs, two pairs of which are situated opposite to each other. The species has been given the scientific name of *thoracica* because of the presence of the unusual thorax. The female *S. thoracica* mates in autumn and each produces a batch of about 20 eggs. They are not enclosed in an egg cocoon like most other spiders but are enclosed in a loose bag of silk which is carried underneath the female body. The "egg-sac" is held by the palps with a silken thread attached to the spinnerets, enabling the fangs to be free for defence. The spiders hatch after about 2 weeks and later hang together in a lattice of silk for up to several days before they undergo the first ecdysis. Development of the spiderlings is slow and it may take them from two to three years to become mature and to be able to mate and

reproduce. Adult spiders are usually found indoors, in or on the ground, or under buildings, usually in dry, sheltered situations. They often occur amongst debris, such as dry leaves, paper, cardboard boxes etc. In native habitats, they live in caves, and amongst rock in dry sheltered places. The closely related species, *S. tardigrada* Thorell, 1881, occurs throughout South-east Asia from Myanamar (formerly Burma) southwards and reaches north-eastern Queensland. It is somewhat paler than *S. fusca* and *S thoracica*, with darker and thinner brown markings on the body. The spiders are of a similar size to the other species previously mentioned and the female carries the eggs in the same fashion as the other species. However, the eggs of this species are enclosed in a sac of soft white silk and the young cling to the sac for several days after hatching. *Scytodes tardigrada* spiders are usually found amongst ferns or near the ground in low foliage.

The family is represented here by the Brown Spitting Spider, *Scytodes fusca* Walckenaer.



(Plate 15)

Scytodes fusca Walckenaer, 1837

Description: Cephalothorax yellow-brown with irregular, variable darker brown markings; legs pale yellow-buff and darker brown. Males are similar to the females but are slightly smaller. Body length: 4-5 mm (males); 5-6 mm (females).

Life history and habits: Commonly known as the Brown Spitting Spider. The species appears to be common in tropical regions of the world and is widespread in Queensland. They usually frequent dry, dark places underneath houses, in garages and in sheds. Sometimes they may occur in more exposed situations around windows and doors facing outside. The mature female lays 10-20 globular, whitish eggs, each measuring about 0.6-0.7 mm in diameter. They are carried, wrapped with a few strands of silk, underneath the female body. The young are also carried about by the female until old enough to disperse. They are nocturnal spiders and feed on moths and other small insects moving about at night on walls and floors.

Habitat: Residential areas.

Distribution: Q, Papua New Guinea, Myanamar (Burma), Thailand, Malaysia.

Photograph: In a shed in suburban Brisbane, Q.; female: 6 mm body length.

Family **Lycosidae**

(Australian species: about 140; World species: about 2300)

This moderately large, cosmopolitan family contains probably some of the most interesting spiders in terms of behaviour. They are commonly called Wolf Spiders because of

their method of capturing prey. They are vagrant hunters, mainly on the ground or amongst low-growing foliage or around the margins of lakes and swamps and on sandy beaches, preying on a wide variety of ground-frequentlng insects and other invertebrates, usually by striking and pouncing on the victims which are often much larger than the spiders themselves. The spider usually sinks its fangs into the body of the prey and mashes the victim into a shapeless and lifeless mass of pulp from which the resulting juices are vigorously sucked through the spider's mouth. Wolf spiders are often common and distinctive, small to medium-sized spiders, usually coloured dark grey or brown but often beautifully patterned in black, grey, brown, white or orange. Most species, with the aid of their very strong chelicerae, construct a short, cylindrical retreat burrow in sand or soft soil. This burrow may be covered with soil particles, leaves or sticks, usually amongst grass or other low-growing vegetation, dead or alive. A few species construct doors which are loosely attached to the entrance of the burrow with a few silken threads. These closed burrows may be confused with those of the true trapdoor spiders (family Dipluridae) but the wolf spiders doors open flat onto the ground, whereas those of trap-doors usually do not open to such a wide angle. Other wolf spiders construct a permanent web-sheet around the burrow entrance.

In Australia, the largest genus is *Lycosa* which contains at least 47 native species, distributed throughout Australia and Tasmania and occurring in all types of habitat. The genus *Venatrix* includes some species previously included under *Lycosa* but now also includes a number of newly described species. *Venatrix pictiventris* (Koch, 1877) is a small black spider, measuring 10-14 mm in length, with a dorsal suffusion of yellow-brown on the dorsal surface; it is common on beaches and sand dunes along creeks in eastern Queensland and New South Wales. The female constructs a small, spherical egg-sac of greyish-brown silk measuring about 5-6 mm diameter. *Lycosa simsoni* Simon, 1898 is a large, distinctive, dark-coloured spider, the female of which measures 15-16 mm in total body length. It is a southern species, occurring from the Sydney area of New South Wales to Tasmania. The spiders construct a burrow in the ground and use a piece of bark, stone or dead leaves as a cover for the entrance. Unlike some other large *Lycosa* species, this species rarely constructs a special lid of soil and silk for their burrow. *Venatrix furcillata* (Koch, 1867) is another common species in eastern Australia. It is often common in suburban gardens of Brisbane and Sydney where it is usually observed running swiftly amongst lawns and is often disturbed by gardeners. Adults are black spiders with the abdomen having two yellow, longitudinal marks; the carapace is bordered in yellow and has a broad, median yellow, longitudinal mark. Adults measure 10-15 mm long with the females considerably larger than the males. The female of this species constructs a spherical, greyish-coloured egg-sac measuring about 5-6 mm in diameter; it contains 50-60 pale cream-coloured eggs. *Lycosa godeffroyi* Koch, 1865 and *L. leuckarti* (Thorell, 1870) are large, mostly brownish spiders with distinctive, radiating, darker brown and white markings on the carapace and the

dorsal surface of the abdomen. They occur throughout the southern half of Australia. *Lycosa godeffroyi* is distinguished by having the undersurface of the abdomen black in colour, while *L. leuckartii* has a pale brownish patch on the ventral abdominal surface bordered with black. Both species construct a shallow burrow in soft, crumbly soil or in sand, often under or against a fallen log or stone. Both species should be treated with caution because they have been known to produce a nasty bite.

The genera *Lycosa* and *Hogna* are illustrated by four and one species respectively in this book.

(Plate 16)

Lycosa bicolor Hogg, 1905

Description: Eyes black (in life), usually turning greenish after death (in preserved specimens); cephalothorax buff to pale greyish-buff in colour, without lateral or median stripes. Abdomen black with a variable buff to pale greyish-buff median stripe on the dorsal surface. Undersurface of the body black. Legs black from near the coxa to the patella; rest of legs buff to pale greyish-buff. Chelicerae with the anterior surface buff to pale grey-buff, becoming red-brown near the fangs. Males are similar in colour pattern to the females but are usually slightly smaller in size. Some specimens from South Australia have a bright lemon-yellow coloration instead of being buff. Body length: 16-20 mm (males); 18-24 mm (females).

Life history and habits: This species inhabits red sandy to clay soils in the arid and semi-arid areas of central and western Australia. The spiders dig an open, vertical burrow, usually in well compacted soil, often near rocky outcrops. They are often more common in disturbed areas such as along the sides of newly graded roads and clearings where they may colonize the sites where the soil is looser as a result of recent disturbance. The burrow of this species is unlike that of many wolf spiders, in that it does not possess a silken/earth lid nor is there any evidence of a mound or elevated rim of soil, sticks or pebbles, around the entrance of the burrow. The spiders prefer to build their burrows in open areas that are not covered with leaf litter, twigs and other debris and do not appear to shelter the burrow entrance under rocks, herbage or logs, as do many other wolf spiders. The depth and diameter of their burrows varies with the age of the spider and the type of soil acting as the substrate; in red loamy soils, the burrows may reach up to 25 cm deep but in harder, more compact clayey soils, the burrow may only measure a maximum of about 10 cm deep; the diameter of the burrow varies from 8-16 mm. *Lycosa bicolor*, like most other wolf spiders, is nocturnal in habits, but females usually do not leave the burrow to search for foods; they merely rest below the the entrance of the burrow often with the front legs and part of the body extended over the edge. When unsuspecting prey move

near the entrance, the wolf spider pounces and grabs the victim with the front legs and drags the prey down into the burrow. Mature spiders are very aggressive and will readily attempt to bite if handled and when first removed from its burrow. Although bites to humans by this spider have not been recorded, this large species should be treated with extreme caution. Females may be commonly encountered throughout the year but in Western Australia they appear to be most common during late spring to summer, from about September to March. The males are rarely encountered in the field and almost nothing is known of their habits. Details on the eggs and egg-sacs of *L. bicolor* are also lacking but they are probably similar to other species of Lycosidae.

Habitat: Woodlands in arid and semi-arid localities.

Distribution: WA, NT, SA.

Photograph: Near Merlinleigh Homestead, WA; female: 22 mm long.

(Plate 17)

Lycosa godeffroyi Koch, 1865

Description: Body and legs generally dusky-grey in colour; carapace with a brown, median, pale yellow-grey line bordered with pale grey, enclosing lines of dark brown and other darker brown marks near the eyes; abdomen longer than the cephalothorax with a pale yellow-grey bell-shaped mark surrounded by dark brown coloration; remainder of dorsal abdominal surface with two pale and indistinct longitudinal lines and dark brownish-grey transverse marks; under side of abdomen totally black; legs grey and grey brown. Males are similar to the females but are slightly smaller. Body length: 15-18 mm (males); 20-25 mm (females).

Life history and habits: This is one of the most common and best known species of the family in Australia. This species digs a burrow in soft, porous soil up to about 15-20 cm deep. The entrance to the burrow is usually adorned with, and often covered by, small twigs, bark, foliage and other debris, often arranged in a radiating or regular pattern. The spiders mature in summer and after mating, the female constructs a large, pill-shaped egg-sac of greyish-white to white silk, which measures 10-12 mm in diameter and about 7-8 mm in height. The egg-sac is protected and guarded at all times by the female in the burrow. The eggs take about 4 weeks to hatch and the young spiders cling onto the dorsal surface of the abdomen of the female in typical wolf-spider fashion. The mature spiders feed on a wide variety of ground-dwelling insects such as grasshoppers, beetles and sheltering moths near the ground, as well as other small spiders. Although this is not usually an aggressive species, it should be treated with some degree of caution, because if handled or disturbed, it can inflict a painful bite which may cause considerable infection and skin lesions to

certain people who are susceptible. However, at the present time, no deaths have been attributed to this spider.

Habitat: Woodlands, dry sclerophyll forests, heathlands, wet sclerophyll forests and residential areas.

Distribution: Q, NSW, V, SA, WA.

Photograph: Specimen found sheltering in the hole of a garden brick in the ground, Brisbane, Q; female: 25 mm body length.



(Plates 18 & 19)

Lycosa leucophaeoides (Roewer, 1951)

Description: Cephalothorax and legs pale grey to pale greyish-brown; abdomen pale greyish-brown to dark buff brown, usually with a few small dark brown marks on the dorsal surface. Males are similar to females but are smaller, the abdomen is pale grey instead of being brownish and the legs are slightly longer. Body length: 18-20 mm (males); 20-22 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behaviour of this species which appears to favour sandy habitats where it digs prominent burrows up to about 10 cm deep and 2 cm in diameter. The burrow is usually dug in soft, fine sandy soil in exposed situations such as on dry creek banks or on bare ground. A large number of burrows may be found in the one small area. The spiders construct a silk and soil plug which acts as a lid for the burrow. The egg-sacs and early life stages have not been described. These spiders are nocturnal and emerge at dusk or later in the evening to forage on the ground for ground-dwelling insects, such as ants, beetles and bush cockroaches and other spiders.

Habitat: Woodlands, dry sclerophyll forests, semi-arid habitats.

Distribution: Q, NSW.

Photographs: Toowoomba, Q; female: 20 mm body length (Plate 18); male: 18 mm body length (Plate 19).


(Plate 20)

Lycosa tula (Strand, 1913)

Description: Body and legs pale grey, carapace dark brown on the sides and bordered with cream and with light brown in the centre; abdomen orange-brown and darker brown; underside of abdomen with a black patch. Males are similar in colour

pattern to the female but are often more brightly coloured on the abdomen. Body length: 12-15 mm (males); 15-18 mm (females).

Life history and habits: Little if anything has been recorded on the biology and habits of this species, which is an arid-adapted wolf spider of central Australia. The burrow, egg-sac and early life stages have not been described by any author.

Habitat: Mallee heathlands, low sandplain vegetation in arid areas.

Distribution: WA, SA, NT.

Photograph: Near Marlee Homestead, WA; male is shown courting the female in their native habitat on red sand; male: 15 mm body length; female: 17 mm body length.

 (Plate 21)

Hogna senilis (Koch, 1877)

Description: Body and legs mostly pale brown to darker brown; dorsal surface of cephalothorax dark brown to chocolate-brown, bordered in pale to darker buff-brown with a broad, median, longitudinal line; abdomen mostly pale brown with variable, small transverse, darker brown marks on the dorsal surface. The colour of this species is rather variable. Males are similar in colour to the females but are somewhat smaller with narrower abdomens. Body length: 8-10 mm (males); 12-16 mm (females).

Life history and habits: Commonly known as the Common Wolf Spider, this species is one of the best known of the Australian members of the family. They frequent dry areas amongst dead grass and herbage, mostly in coastal areas. They live in a shallow burrow about 3-4 cm deep in soft soil at the base of dead grass or other debris; they may also shelter under fallen bark, hollowing out a retreat in the ground below. The female constructs an almost spherical to spherical egg-sac, 7-10 mm in diameter of white to greyish-coloured silk (sometimes the silk is blue-grey). The egg-sac is well guarded by the female and is carried around attached to the end of the abdomen. The egg-sac contains 40-70 pale brown, non-glutinous, spherical eggs, each measuring about 1.0 mm in diameter. After hatching, the young spiderlings are carried on the female abdomen until they moult and grow larger. The mature spiders feed on a wide variety of ground-dwelling insects such as small beetles and cockroaches and other spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, NT, WA.

Photograph: Brisbane, Q; female: 12 mm body length.

Family **Dysderidae**

(Australian species: about 10: World species: about 480)

This is a small family of spiders, most of which measure about 10 mm long. They are mostly brown to dark grey in colour, with the abdomen often possessing irregular bands of darker colour. They have the appearance of being shiny although they are usually slightly hairy. They have a long cylindrical abdomen and the first three pairs of legs are directed forwards. They are mostly ground-dwelling, nocturnal, hunting spiders, hiding during the day under stones or fallen bark. Some members of the genus *Ariadna* live in silk-lined tubes in tree trunks and amongst rocks. Silken lines (trip-threads) radiate from the entrance of the tubes and extend outwards by vertical supports. The spider waits at the retreat entrance until an insect disturbs the spiral lines. The family is found all over mainland Australia and Tasmania.

The introduced species, *Dysdera crocata* Koch is described below.

(Plate 22)

Dysdera crocata Koch, 1838

Description: Cephalothorax and legs reddish to brownish-red; abdomen cream to dull yellow. The males are similar to the females but are smaller and more slender. Body length: 10-12 mm (males); 12-15 mm (females).

Life history and habits: This spider is found under stones, in crevices in the soil, at the base of herbaceous plants, in garden rubbish heaps and in many other situations close to the ground which are moist. Although the female does not spin a web for the capture of prey, it often encloses itself in a cocoon-like nest of strong white silk. In this nest, the female constructs the egg-sac in which 25-40, non-glutinous, spherical, dark cream-coloured eggs, each of which measure about 1.0 mm in diameter, are laid. Mature males and females occur in summer and the autumn. The favoured prey of this species are slaters (woodlice-crustaceans) for which the front legs are adapted for capture. This introduced species from Europe was mistakenly described as a native Australian species at the turn of the century. There have been many severe bites recorded from this species. For instance, in Lindisfarne in Tasmania, a girl of twelve (12) years of age was bitten on the hand while weeding the garden; she developed various symptoms such as a fever, nausea, and profuse swelling of the infected area and she required treatment in hospital for two or three days.

Habitat: Residential areas.

Distribution NSW, V, SA, T.

Photograph: Melbourne, V; female: 14 mm body length.

Family **Oxyopidae**

(Australian species: about 15; World species: about 430)

Spiders of this family are commonly called Lynx Spiders because of their incredible agility and speed when moving from place to place, a behaviour pattern reminiscent of that of certain big cats. They are mostly small spiders measuring from about 5-8 mm body length. They have long, narrow legs which bear conspicuous spines situated at right angles (or nearly so) to the leg segments. Their spiky appearance makes them readily recognizable as a member of this family. They build no web-snare but are active hunters, frequenting grass, small shrubs and bushes, and other low vegetation (they are rarely found on the bare ground), where they use their very acute eyesight and jumping ability to capture prey and to avoid predators. Their eyes are characteristically arranged in a pattern of four rows of two eyes each. During hunting, usually undertaken in bright sunlight, they leap from leaf to leaf and when at rest, they flatten themselves against a broad leaf where they are camouflaged as a result of their pale green to dark green and brown coloration matching that of the leaves and twigs. Lynx spiders are easily recognized because of the sharp (usually black) spines on the legs, which presumably assist the spider in scrambling from leaf to leaf.

Two genera are represented in Australia, the majority of the species have been placed in the type genus *Oxyopes* (about 14 described species, represented Australia-wide). They are mostly rather attractive and distinctive spiders, yellow, green and/or brown in colour with dark stripes on the dorsal part of the cephalothorax and the abdomen. One Australian species, *Oxyopes gracilipes* (White, 1849) has been recorded from New Zealand, where it is believed to have arrived there from Australia by the process of ballooning. It is the only member of the Oxyopidae known from New Zealand, which poses some very interesting questions as to why that land mass has remained devoid of these spiders for so long. The other Australian genus is *Peucetia*, represented by only one species, *P. albescens* Koch, 1878 from northern Queensland. Nothing has been recorded on its biology and behaviour.

The genus represented here is *Oxyopes*.

(Plate 23)

Oxyopes elegans Koch, 1878

Description: Body and legs pale green to pale greenish-brown, with two series of brown to dark brown longitudinal marks on the dorsal surface of the cephalothorax and abdomen; abdomen with additional brown and black marks on the lateral margins;

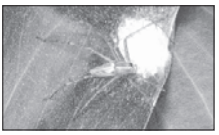
the pattern is often variable; spines on legs black; body length 4-5 mm (males); 5-7 mm (females); males smaller and more slender than the females.

Life history and habits: Commonly called the Elegant Lynx Spider. They are often commonly encountered during the summer months amongst various grasses, weeds and other low-growing native plants such as peas, heaths and lilies. They build no web but are active solitary hunters during the day. During the night they hide amongst foliage. Females produce a small, white, oval-shaped cocoon containing 35-45 eggs, usually amongst grass stalks or under a broad, curled leaf. The non-glutinous eggs are pale cream in colour and measure 0.5-0.6 mm in diameter. Adult spiders feed on small lace-bugs, moths, small soft-bodied flies and occasionally beetles.

Habitat: Usually open areas in woodlands, dry sclerophyll forests and residential areas.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 7 mm body length.



(Plate 24)

Oxyopes quadrifasciatus Koch, 1878

Description: Body and legs pale yellow to yellow-green; cephalothorax and abdomen with four, longitudinal median, orange stripes; abdomen with one black longitudinal stripe on the lateral margins; undersurface of abdomen pale coloured with a very broad, median, black longitudinal mark extending the whole length of the abdomen. Males are smaller in colour pattern to the females but are slightly smaller and have large, blackish palps. Body length: 9-10 mm (males); 10-14 mm (females).

Life history and habits: Commonly known as the Orange-striped Lynx Spider because of the bright colour pattern on the dorsal part of the body. This species is one of the largest of the family in Australia and is diurnal in habits and is usually encountered resting or foraging on the upper surfaces of broad-leaved trees and bushes. The females construct a circular, disc-shaped egg-sac measuring 7-8 mm diameter of soft white silk and is pressed down at the edges and covered with a few strands of strong silk. It is usually placed on the upper surface of a leaf of a broad-leaved plant and the female closely guards over the sac. The egg-sac contains 65-75 pale yellow to buff coloured, non-glutinous, spherical to broadly ovoid eggs, each measuring about 0.5-0.6 mm in diameter. The mature spider feeds on a wide variety of diurnal, flying insects such as flies and small bees and wasps; small spiders sharing the niche on leaves are also eaten.

Habitat: Heathlands, dry sclerophyll forests, woodlands.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female on an egg-sac on the upper surface of a leaf of *Acacia leiocalyx* (Mimosaceae): 12 mm body length.

Family **Zodariidae**

(Australian species: approx. 110; World species: about 620)

In Australia, very little is known about the biology and distribution of this family. Even the number of species is uncertain but at the present time, at least 20 genera and 110 species have been described from Australia and its island territories. They are usually small, terrestrial spiders, measuring up to 15 mm body length; they live under stones, rotten logs and amongst litter. Some species live in burrows in the ground and construct a palisade of twigs or debris around the entrance of the burrow. They do not construct any web to catch prey and are best described as vagrant hunters. Their eyes may be arranged in the traditional two rows of four eyes, or in three rows, consisting of 2, 2 and 4 eyes. Spiders of this family are usually dark in colour, shiny purple to black, sparsely hairy, and the dorsal surface of the abdomen is often adorned with white to dark yellow spots. The family is represented in Australia by several genera, but *Storena* is the best known and documented genus, with about 29 species. *Storena* are shiny, dark red and red-brown to black spiders, measuring up to about 15 mm body length; most of the species have white to orange dorsal spots on the abdomen. This genus is represented Australia wide. They are typically vagrant hunters, although a few species dig burrows amongst litter, from which they seize prey that wander unsuspecting near the entrance. Some species are reported to build an opaque egg-sac composed of white silk; it is constructed in two pieces and connected with other silken threads. The female remains with the egg cocoon until the young hatch. *Hetaerica* and *Neostorena* are genera mainly restricted to eastern Australia; the best known species of the first genus, *H. scenica* (Koch, 1872) occurs in north-eastern Queensland where it occurs in open wet sclerophyll forests, heathlands and dry vine thickets. There have been several reports of bites from this spider. One bite produced only mild pain (for how long is not recorded), while the other bite produced on the skin of the victim a white area about 2 cm in diameter surrounded by a broader 5 cm diameter red cellulitic area (how long this persisted is not recorded). The endemic genus *Neostorena* is represented by 6 species in eastern Australia, one of which, *N. venatoria* Rainbow, 1914, is restricted to southern Victoria. *Neostorena torosa* (Simon, 1908) is the only species of the genus restricted to Western Australia. Nothing has been recorded on their biologies.

The genus *Storena* is represented in this book by four species and *Zillimata* by one species (monotypic).

(Plate 25)

Storena formosa Thorell, 1870

Description: Cephalothorax black in the upper half and dark reddish in the posterior half; abdomen mostly shiny black with four orange spots on the dorsal surface and a lighter-coloured apical mark; legs mostly orange-red. Males differ from females in having a totally black cephalothorax and a dull black abdomen with large yellow spots on the dorsal surface and reddish legs. Body length 10-12 mm (males); 14-16 mm (females).

Life history and habits: Little has been recorded on the biology and behaviour of this attractive species. Like most members of this family, they are vagrant hunters on the ground and amongst fallen leaves and other debris and are mainly active at night. They construct small shelters of dead leaves and twigs under logs. The egg-sac and early life-stages are unknown. The spiders become very active if disturbed and scurry for cover under leaves etc. Adults probably feed on a wide variety of small, ground-dwelling insects.

Habitat: Woodlands, sclerophyll forests, semi-arid areas.

Distribution: Q, NSW, SA, WA, V, Lord Howe Island.

Photograph: Alberton, Victoria; female: 15 mm body length.

(Plate 26)

Storena annulipes (Koch, 1867)

Description: Cephalothorax and body mostly black; abdomen with about four median, lunate, bright yellow, dorsal marks and three smaller yellow marks at the apex; sides of the abdomen each with another two yellow marks; underside of abdomen with a single, median, pale yellow line; legs dark reddish-brown, the first pair of legs with two broad, white bands, the remaining legs with one similar band. Males are similar to females but are slightly smaller and thinner. Body length: 8-9 mm (males); 8-10 mm (females).

Life history and habits: Nothing has been recorded previously on the biology and behaviour of this attractive species. Adults occur during summer under the fallen bark of various *Eucalyptus* species (Myrtaceae) and construct small shelters of small pieces of bark and other debris. The egg-sac and early life stages are unknown. If disturbed, the spiders rapidly run along the ground where they seek cover and remain resting motionless until further disturbed. Adults probably feed on a wide range of insects and other invertebrates under fallen bark.

Habitat: Coastal woodlands and dry sclerophyll forests.
Distribution: Q.
Photograph: Brisbane, Q; male: 9 mm body length.

 (Plate 27)

Storena maculata O. Pickard-Cambridge, 1869

Description: Legs deep scarlet-red, cephalothorax and abdomen dark purplish-black; abdomen with four yellow, lunate marks arranged in two series on the dorsal surface. Males are similar to females in colour pattern but are smaller and thinner. Body length: 7-8 mm (males); 9-10 mm (females).

Life history and habits: Nothing has been recorded previously on the biology and behaviour of this species and the earlier life stages are unknown. Adults are found amongst leaf litter and under stones and rocks in moist situations.

Habitat: Rainforest.
Distribution: Q.
Photograph: Mt. Glorious, near Brisbane, Q; female: 9 mm body length.

 (Plate 28)

Zillimata scintillans (O. Pickard-Cambridge, 1869)

Description: Cephalothorax and underside of body dull dark brown; abdomen chocolate brown with six pale yellow to pale orange-yellow spots of varying sizes arranged in two rows of two and two single spots on the dorsal surface of the abdomen; margins of the abdomen bordered in pale yellow. Males are similar to the females but are smaller. Body length: 5-7 mm (males); 6-8 mm (females).

Life history and habits: Nothing has been recorded previously on this rare species which appears to be confined to the coastal areas of southern Western Australia, southern South Australia and southern eastern Queensland. It is presently the only species in the genus (monotypic). It is typical of the family in being a vagrant hunter and probably feeds on a wide variety of small ground-dwelling insects.

Habitat: Coastal heathlands, woodlands, rural lands.
Distribution: WA, SA, Q.
Photograph: Singleton Beach, Perth, WA; female: 8 mm body length.

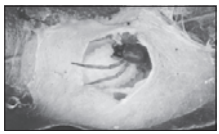
Family **Clubionidae**

(Australian species: about 17; World species: about 530)

This medium-sized, world-wide family is closely related to the Gnaphosidae, Miturgidae and Corinnidae but they differ in a few morphological features. Clubionid spiders are usually small, light brown to darker brown spiders measuring less than 15 mm long; they usually have a long, narrow body and the chelicerae are in contrast with the rest of the body in often being broad and black in colour. The mature spiders usually construct a tubular silken retreat amongst foliage on living trees, in dead, rolled-up leaves, under bark, stones and logs and amongst debris on the ground.

The family is represented in Australia with 2 genera and about 17 species. Many of the genera previously classified under this family have been transferred in recent times to other families. The main genus represented in Australia is the world-wide *Clubiona,* of which 16 species are presently recognised as occurring in mainland Australia as well as Lord Howe Island. *Clubiona* are mostly small spiders less than 12 mm body length, usually pale creamy-buff in colour with darker grey, brown or blackish marks on the cylindrical abdomen. They usually construct a tubular silken retreat under bark or stones, or amongst leaves. In spring and summer, the females are usually found enclosed within their retreats, closely guarding their flattened egg-sacs of white silk.

The genus *Clubiona* is represented here by three species.



(Plate 29)

Clubiona robusta Koch, 1873

Description: Chelicerae dark reddish-brown to mostly black; cephalothorax and legs orange-brown to reddish-brown; abdomen dark creamy-grey with often a distinctive pattern of grey to dark grey-brown marks on the dorsal surface. Males are smaller than females and have a more slender abdomen. Body length: 12-15 mm (males); 15-22 mm (females).

Life history and habits: This is perhaps the most common and widespread species of *Clubiona* in Australia. The species is often observed under the bark of trees, in particular that of *Eucalyptus* species, but can also be common on broad-leaved plants amongst foliage. The silken retreat is usually oblong in shape and varies from 25-50 mm in length and 15-25 mm wide. The egg-sac measures 10-12 mm in diameter and contains 80-140 globular, mostly cream-coloured eggs, each measuring about 0.8 mm in diameter. Mature spiders feed on wide variety of

bark- and leaf-dwelling insects such as bugs, moth and beetle larvae, other spiders and adult beetles.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA, T, NT.

Photograph: Nimbin, NSW; female: 20 mm body length.

 (Plate 30)

Clubiona modesta Koch, 1873

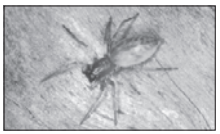
Description: Chelicerae dark reddish-brown to black; cephalothorax and legs orange-brown to reddish-brown; abdomen dark cream with a distinctive pattern of grey to grey-brown marks on the dorsal surface. Males are smaller than females and have a more slender abdomen. Body length: 7-8 mm (males); 9-10 mm (females).

Life history and habits: This species is very closely related to the better known species, *C. robusta* Koch. It is similar in colour pattern but it is a much smaller species and the eggs are of a different colour, number and size. The spiders mature in summer and the female usually constructs a silken retreat measuring about 20-25 mm in length by about 7-10 mm wide in a curled leaf on a living plant or in a piece of curled bark on a tree. The egg-sac measures about 6-8 mm in diameter and contains about 25-35 globular, pale greenish-coloured eggs, each measuring about 0.6-0.7 mm in diameter. The young spiderlings hatch within a few weeks and remain with the retreat and the female for a considerable period before moulting and gradually dispersing. Mature spiders feed on a wide variety of bark- and leaf- dwelling insects and other spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V.

Photograph: Brisbane, Q; female: in the curled leaf of *Acacia leiocalyx* (Mimosaceae); 10 mm body length.

 (Plate 31)

Clubiona elaphines Urquhart, 1893

Description: Chelicerae dark brown to black; cephalothorax dark reddish-brown; abdomen dark cream with a distinctive pattern of grey and grey-brown marks on the dorsal surface. Males are smaller than the females and have a much slender abdomen. Body length: 14-16 mm (males); 22-25 mm (females).

Life history and habits: Commonly known as the Giant Clubionid Spider because this is the largest species of the genus in Australia and one of the largest in the family. It is widespread in Tasmania and Victoria where it usually occurs under the loose bark of various gum trees (*Eucalyptus* species, Myrtaceae) and on fallen bark on the ground. The spiders mature in spring to early summer and the female constructs a broadly oval to almost rectangular-shaped retreat measuring about 30-45 mm long by about 15-25 mm wide. The egg-sac measures about 10 mm in diameter and contains 40-50, spherical, pale cream-coloured, non-glutinous eggs, each measuring about 1 mm in diameter. The female guards the eggs until they hatch within a few weeks. The young spiders remain with the retreat and the female for some time before they undergo further moults and later dispersion. Mature spiders feed on a variety of bark-dwelling insects and other small spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: V, T.

Photograph: Gippsland area, Vic; female: 29 mm body length.

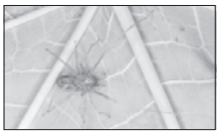
Family **Miturgidae**

(Australian species: about 32; World species: about 370)

The largest genus of this family in Australia is *Miturga* with about 12 species, occurring over mainland Australia and Tasmania. The next largest is *Cheiracanthium* (with about 9 species). These two genera were previously placed in the family Clubionidae. Most of the other genera of the family are little known and nothing appears to have recorded on their biologies. *Uliodon*, which is apparently more related to lycosids and some other families, is represented by 7 species and there is one recorded from New Zealand [*U. frenatus* (Koch, 1873)]. The genus *Miturga* contains some of the largest species of clubionoid spider recorded from Australia; some species have a body length of 15-20 mm. They are generally dark greyish brown to brown in general coloration with the abdomen often having black, white and/or grey marks on the dorsal surface. Their form and colour pattern resembles that of some of the larger wolf spiders, so much so, that they are often mistaken for the Lycosidae. They construct a broad, tubular retreat, which may measure up to 10 cm in diameter, near the ground in or under fallen logs, under and amongst stones and in low herbaceous plants such as herbs and grasses. *Cheiracanthium* are small spiders measuring about 5-10 mm long and are similar to *Clubiona* (Clubionidae) in form and coloration; they are mostly pale cream in colour but some species may be greenish-yellow, buff-brown or darker brown in general coloration, with the abdomen often with a median dorsal stripe of yellow, green or brown. In all species, the chelicerae are dark brown and are large in proportion to the rest of the body. They construct small, tubular silken retreats measuring about 10-20 mm in length,

usually under the peeling bark of *Eucalyptus* and other native trees, under stones or amongst leaves. Some species nest in dead, rolled-up leaves amongst living foliage. The eggs are laid in small clusters of 10-16 in the retreat and they hatch from late summer to autumn.

The genera represented in his book are *Cheiracanthium* (3 species) and *Miturga* (one species).



(Plates 32 & 33)

Cheiracanthium gracile Koch, 1873

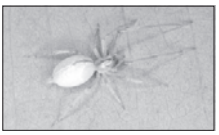
Description: Cephalothorax and legs pale buff-brown; abdomen pale creamy colour with a darker brown longitudinal median mark extending about half way along the abdomen. Males differ from the females in having a darker cephalothorax and legs, longer legs and a greenish or yellow-green abdomen. Body length: 8-9 mm (males); 9-10 mm (females).

Life history and habits: Commonly known as the Long-legged Garden Spider. This species is common in residential gardens in eastern Australia but they are very secretive and are seldom seen by the passing observer or gardener. They usually construct a thin silken retreat on the undersurface of a living leaf or a garden plant and sometimes curl the margins of a leaf over to form a silken tunnel in which they rest and nest. They also nest in dead, curled leaves above ground level. The genus *Cheiracanthium* contains some species which are known to be dangerous to humans. Although *C. gracile* is not known to be dangerous, it should be handled with care or avoided, especially the male which has large and relatively powerful mandibles. However, a bite from these spiders must be considered rare as they are very timid (and agile) spiders which leap from their silken retreats to the ground or foliage below if disturbed. If handled, they usually run rapidly from the hand and leap and scurry for cover without attempting to bite. In other *Cheiracanthium* species, a bite will induce a short but severe illness followed by necrosis (i.e. tissue breakdown) in the region of the bite. The necrotic area takes a considerable time to heal. The adverse effects of a *Cheiracanthium* bite are not pleasant but fortunately there are no records of human deaths from these spiders. The egg-sac and early life-stages of *C. gracile* have not been recorded. Mature spiders feed during the night in a wide variety of insects such as bugs, flies, aphids, mosquitoes and other small spiders.

Habitat: Woodlands, heathlands, dry sclerophyll forest, residential areas.

Distribution: Q, NSW.

Photograph: Brisbane, Q; male (plate 32) and female (Plate 33) on the underside of papaw (*Carica payaya*, Caricaceae) leaves; male and female: 9 mm body length.



(Plate 34)

Cheiracanthium gilvum Koch, 1873

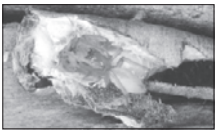
Description: Cephalothorax and legs pale reddish-brown; abdomen cream-coloured with a median, dorsal reddish-brown longitudinal mark extending for about half way along the abdomen. Males are similar to females but are slightly smaller with longer legs. Body length: 7-8 mm (males); 8-10 mm (females).

Life history and habits: Commonly known as the Common Garden Leaf Spider since it is often a common species in residential gardens in eastern Australia. Like other species of *Cheiracanthium*, this spider is nocturnal, secretive and hides during the day in a silken retreat usually placed on the underside of leaves of broad-leaved plants or in curled dead or living trees. After mating, the female constructs a broadly oval-shaped egg-sac of white silk, which measures 7-9 mm long and 5-6 mm wide. The egg-sac is placed in the centre of the retreat and contains 40-50 glutinous, pale cream-coloured, globular eggs, wrapped in a layer of fine white silk. Each egg measures about 0.7-0.8 mm in diameter. The spiders feed on a variety of small, soft-bodied insects such as flies, mosquitoes, leaf bugs and lace-wings.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 9 mm body length.



(Plate 35)

Cheiracanthium diversum Koch, 1866

Description: Cephalothorax and legs pale reddish-brown; abdomen cream-coloured with only a faint longitudinal mark on the dorsal portion of the abdomen (or absent). Males are similar to females but have a slightly smaller body and longer legs. Body length: 8-9 mm (males); 10-12 mm (females).

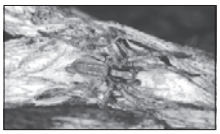
Life history and habits: This species has similar habits to other species of *Cheiracanthium*. The spider is usually nocturnal in activity and hides during the day in a silken retreat measuring up to about 20 mm long on the underside of leaves, in curled dead leaves or sometimes amongst bark and in corners of rooms and ceilings in houses. The female constructs a broadly oval-shaped egg-sac of white silk into which is placed a cluster of 30-40, glutinous, pale cream-coloured eggs, each measuring

about 0.6-0.7 mm in diameter. The mature spiders feed on a variety of small, soft-bodied insects such as flies and mosquitoes.

Habitat: Woodlands, heathlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA.

Photograph: Brisbane, Q; female: 11 mm body length.

 (Plate 36)

Miturga agelenina Simon, 1909

Description: Cephalothorax and legs black with a dense covering of short, silver-grey hairs; abdomen grey-brown with a central brown region dorsally, bordered in black and with two series of lighter brown patches. Males are similar to females in colour pattern but are more slender with longer legs. Body length: 10-12 mm (males); 15-18 mm (females).

Life history and habits: This attractive miturgid has a wide distribution over southern Australia. It constructs a silken retreat close to the ground amongst grass tussocks, under fallen bark and amongst other debris on or near the ground. The female constructs a rounded egg-sac measuring about 10 mm in diameter and is enclosed within the retreat. Each sac contains 80-100 cream-coloured, globular, non-glutinous eggs, each measuring about 1 mm in diameter. The mature spiders feed on a variety of ground-dwelling insects and other arthropods, mostly during the night.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: WA, SA, V, T.

Photograph: Melaleuca Park, Perth, WA; male: 12 mm body length.

 (Plate 140)

Miturga lineata (Thorell, 1870)

Description: Body mostly brown and grey with a pattern of dark and lighter bands of dark brown to black extending along the prosoma and dorsal abdomen. Males are similar to females in colour pattern but are more slender with longer legs. Body length: 10-12 mm (males); 15-18 mm (females).

Life history and habits: This is another attractive miturgid which has a wide distribution over southern Australia. It constructs a broad silken retreat close to the ground under loose flat stones. The female constructs a rounded, yellowish egg-sac

measuring about 10-15 mm in diameter and is enclosed within the retreat. The mature spiders feed on a variety of ground-dwelling insects and other arthropods, mostly during the night.

Habitat: Woodlands, dry sclerophyll forests, heathlands.

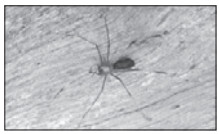
Distribution: WA, SA, V, T.

Family **Corinnidae**

(Australian species: about 10; World species: about 900).

This family is closely related to the families Clubionidae and Gnaphosidae and many of the species in the family were first described as clubionids or gnaphosids. It is a medium-sized family and occurs mostly in the tropical and sub-tropical regions of the world. Many of the species mimic ants upon which they feed. *Corrinomma* is represented by a number of ant-mimicking forms in Australia and some of these are undescribed. The spiders of this genus may be identified by the eye formation. The eight eyes are situated on a slightly raised eminence at the anterior end of the caput, which is long and tapering, and the eyes are positioned in two recurved, widely separated rows. The lateral eyes are slightly smaller than the median eyes. There is an undescribed species of *Corrinomma* from north-eastern Queensland which feeds on the Green Tree Ant, *Oecophylla smaragdina* (family Formicidae) and has an abdomen with two large black spots which resemble the head of the ant upon which it feeds. When alarmed or disturbed, the spiders raise the abdomen to scare off intruders, as then the spider really looks like the aggressive Green Tree Ant. The genus *Supunna* consists of very active black spiders, usually patterned with white bands and spots and other irregular marks; often one or more pairs of legs are adorned with orange or dark yellow coloration. They are secretive spiders and usually live under rocks in natural habitats but may also live in the cracks of fences and houses in residential areas. If disturbed, they run rapidly in all directions and are very difficult to catch.

The genera represented in his book are *Corrinomma* (one species) and *Supunna* (two species).



(Plate 37)

Corrinomma suaverubens Simon, 1896

Description: Cephalothorax dark orange; abdomen glossy black or purple-black; legs long, slender, mostly orange with darker markings on the last pair of legs which have the distal half of the patella and femur black. Males are similar to

females in colour pattern but are slightly smaller. Body length: 5-6 mm (males); 7-9 mm (females).

Life history and habits: Commonly known as the Ant-mimicking Ground Spider because of the striking and contrasting colour pattern which matches very closely that of certain tropical ant species upon whose larvae the spiders prey. This spider is probably one of the most interesting species in Australia, but little appears to have been written on its biology. They are usually active on hot summer days running rapidly over logs and on the ground amongst the ants which they mimic both in colour pattern and behaviour. They run erratically and when moving forwards, they raise the abdomen up and down in a characteristic motion like that of the so-called Silly Ants of the genus *Metromyrmex* (family Formicidae: Hymenoptera), which also walk with their abdomens raised and moving up and down. The egg-sacs and early life-stages of this spider have not been described but the egg-sacs are probably placed near the ground under or in fallen logs or rocks.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q.

Photograph: Under a portion of an old tree stump lying on the ground, Toowoomba, Q; female: 8 mm body length.

(Plate 38)

Supunna albopunctum (Hogg, 1896)

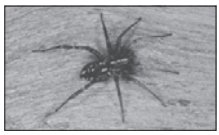
Description: Cephalothorax, abdomen and legs dull black; abdomen with several small white spots and at least two short, longitudinal marks (near cephalothorax) on the dorsal surface. Males are similar to females but are slightly smaller. Body length: 7-9 mm (males); 10-12 mm (females).

Life history and habits: Little has been recorded on the biology and behavior of this species. Like most members of the genus, they hunt on the ground and do not produce any web or snare. On the ground they are very difficult to catch, especially in hot weather, racing from place to place and hiding amongst leaf litter and other debris. During the summer the female constructs a flat, very white, disc-shaped egg-sac of brittle silk measuring about 7-9 mm diameter, usually placed under a fallen log or under a piece of bark on a tree. They are commonly parasitized by small black wasps. The mature spiders feed on a wide variety of ground-dwelling insects and other arthropods.

Habitat: Woodlands, dry sclerophyll forests, semi-arid habitats.

Distribution: NT, NSW, Q.

Photograph: Toowoomba, Q; female: 11 mm body length.



(Plate 39)

Supunna picta (Koch, 1873)

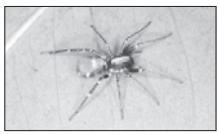
Description: Body and legs mostly dull black, the front two pairs of legs often with a pale brown tinge; carapace with a narrow white, median longitudinal line, abdomen on the dorsal surface with a short median white longitudinal line on the anterior margin of the abdomen and several short white marks on the sides of the abdomen and towards the posterior margin. Males are similar to the females in colour pattern but are slightly smaller. Body length: 5-6 mm (males); 6-7 mm (females).

Life history and habits: This species is closely related to the previous one, *S. albopunctatum* (Hogg) but it is much smaller and the white patterns of the carapace and dorsal surface of the abdomen are markedly different; *S. picta* appears to be the fastest mover of the two species and is often found running to the sides of brick houses in residential areas adjacent to bushland where they hunt a variety of insects. When on the ground or on fence and walls, they usually run quickly in one direction in a short burst of speed before resting motionless for an undetermined period of time with the legs spread wide apart on the substrate. They will then change direction without warning and continue their rapid running behaviour with a sudden pause. Even on brick walls, their motionless state and coloration makes them almost impossible to detect, even at close range. During autumn to winter, the females construct their egg-sacs which are flat, disc-shaped and constructed of very white silk and measure 5-6 mm in diameter. The egg-sac is usually securely fastened to the substrate which is usually a flat stone or piece of bark on the ground. Mature spiders feed on small ground dwelling insects and other small spiders.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW.

Photograph: Spider collected from the wall of a brick house, Brisbane, Q; female: 6 mm body length.



(Plate 40)

Supunna picta (Koch, 1873)(Apparent ant-mimicking form)

Description: This appears to be a rare ant-mimicking form of *S. picta*. The white markings are much reduced and the spots on the abdomen are absent and there is a variable patch of gold to light brown on the posterior and dorsal median regions of the abdomen.

Life history and habits: The colour pattern of this form appears to closely match that of the colour pattern of the very common *Polyrachis* ants (Formicidae: Hymenoptera) which occur sympatrically in woodlands and dry sclerophyll forests in which the spider also inhabits. The spider is active during the day, rapidly scurrying amongst leaf litter, on bare ground, on the trunks of trees and amongst branches and foliage of small bushes and shrubs during summer, especially on hot days. These spiders are very wary and active when foraging on small, insects, such as ants and flies and other spiders which the encounter during their forays. These ant-mimicking spiders occur in the same habitat as the normal white-spotted form of *S. picta*. Little is known of the genetics and ecology of this variation or whether the ant mimic is indeed a separate undescribed species or only a subspecies of the typical *S. picta*.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q.

Photograph: Spider on a leaf of *Acacia* species (Mimosaceae), Brisbane, Q; female: 7 mm body length.

Family **Lamponidae**

(Australian species: about 185; World species: 190)

This almost exclusive Australian family contains 22 genera, the main one being *Lampona*, of which about 56 species have been described from Australia; most of these have been recently described. There is only one species known from Papua New Guinea, but this number is likely to rise once that country's spider fauna is properly studied. *Lampona* are usually small spiders with long cylindrical bodies. They are drab grey to dark greyish-brown in colour with reddish and black legs; there are usually white spots and other markings on the abdomen. *Lampona* are mostly nocturnal in habits and are to be found during the day resting under bark, stones and amongst leaf litter or sometimes sheltering in a small, silken tubular retreat. *Lampona cylindrata* (Koch, 1866) is the best known species of this genus because it is often common, it has a wide distribution throughout southern Australia (and New Zealand) and is known to be dangerous to humans, the bites of which are known to cause severe illness. It seems likely that other species may also have a dangerous bite and these species have in the past been misidentified as *L. cylindrata*.

The family is represented here by *Lampona cylindrata* (Koch).

(Plate 41)

Lampona cylindrata (Koch, 1866)

Description: Males- Cephalothorax and abdomen dark grey to almost black with a prominent white apex to the abdomen which also has two white to cream spots near the anterior median area. Females- broader than the males, dark grey with very faint and indistinct white marks on the dorsal surface of the abdomen, which fade with age. Body length: 12-15 mm (males); 15-18 mm (females).

Life history and habits: This is the best known species of the family in Australia, commonly called the White-tailed Spider. Although there have been no deaths recorded from this spider, and despite downplaying by the Australian scientific community to the contrary, the bites are known to cause severe illness in humans. The symptoms recorded for a bite from this species have been local discoloration of the skin at the bite-site, headaches, chills, pyrexia and local itchiness. In both Australia ad New Zealand, the spider usually occurs under stones and the bark of trees and bushes in native habitats and sometimes in crevices between slabs of rock. It is also known to wander into houses and sheds where it appears to prefer cool, dry conditions such as under carpets, boxes and loose boards etc. In these situations, they are often encountered by the unsuspecting housewife or home handyman and bites to humans may then occur. The female constructs a circular-shaped egg-sac of fine white silk, sometimes decorated with particles of debris, which measures about 8-10 mm diameter. The egg-sac contains 50-100 large, non-glutinous, bright pink-coloured eggs, each measuring about 1.0-1.2 mm in diameter. The young spiders emerge in about 60 days and immediately spin a communal sheet web under which they congregate. They disperse in about a week after emergence. The spiders mature during mid to late summer and feed on a wide variety of insects and other spiders, especially those of the genus *Badumna* (family Desidae). Sometimes, the spider has been found living in close proximity to the webs of *Badumna insignis* (Koch, 1872) and has been observed to enter the web of that species and prey upon the newly emerged spiderlings.

Habitat: Woodlands, residential areas.

Distribution: Q, NSW, V, SA, WA, NT, T, New Zealand.

Photograph: Melbourne, V; female: 18 mm body length.

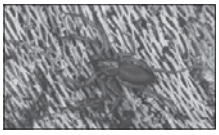
Family **Gnaphosidae** (**Drassidae**)

(Australian species: about 40: World species: about 2000)

This is a world-wide family of rather drab brown and black coloured, flat, mostly nocturnally active spiders, which are usually secretive under bark and flat rocks during the day.

The family is divided into two main subgroups, the first one contains rather small but stoutly built spiders with cylindrical abdomens while the other group is comprised of very flat spiders with broad abdomens. The second group have laterigrade legs like those of the families Sparassidae and Thomisidae and many species have a superficial resemblance to the true Huntsmen Spiders (family Sparassidae). The Gnaphosidae is well represented in Australia with about 16 genera, most of which are endemic and composed of only a few species. The largest representative genus is *Hemicloea* which consists of about 18 species, distributed mostly throughout the drier areas of Australia. The body of these spiders is characteristically very flat and oblong in shape; they are usually shiny black or brown and are found under bark, stones or fallen logs, amongst leaf litter and other debris and some species have been collected from foliage. The best known species of the genus is *H. major* Koch, 1875, which is a large, flat black spider from southern New South Wales and is often common in the sandstone country around Sydney and the Blue Mountains as well as the Canberra district. The female grows up to 30 mm in total body length while the male is much smaller. During summer the female constructs three or four, circular, disc-shaped egg-sacs each measuring about 20-30 mm in diameter which are composed of dirty-white to brownish coloured silk with a granular, rough surface. These egg-sacs, which usually overlap, are placed under slabs of rock and each contain 50-80 pale cream. non-glutinous eggs which measure about 1.2 mm in diameter. The genus *Rebilus* is related to *Hemicloea* but members of the former genus are distinguished by the number of spinnerets which number 4 while *Hemicloea* has 6 (3 pairs). They have similar habits to *Hemicloea* but the egg-sacs are smooth and composed of very white silk. There are five Australian species, with three species in eastern Australia, with one endemic species each in Victoria and western Australia.

The genus represented in this book is *Rebilus*.



(Plate 42)

Rebilus castaneus Simon, 1908

Description: Body and legs dark reddish-brown to dark brown; body very flat. Males are similar to females in colour and shape but have longer legs. Body length: 10-12 mm (males); 14-16 mm (females).

Life history and habits: Little has been recorded on the biology of this species. Like most members of the genus, adults are usually found living under flat slabs of loose rock on exposed rocky sandstone outcrops or on hilly, granitic slopes. The females mature in late summer to early autumn and after mating, each constructs a flat, circular egg-

sac of very white, smooth silk, measuring about 15-20 mm in diameter. It is placed under loose pieces of rock. The egg-sac contains 40-50 pale cream coloured, non-glutinous, spherical eggs, each measuring about 1.1-1.2 mm in diameter. The mature spiders feed on a wide variety of ground-inhabiting insects and other spiders.

Habitat: Heathlands, woodlands.

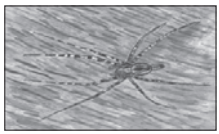
Distribution: WA.

Photograph: Perth, WA; female: 15 mm body length.

Family **Hersiliidae**

(Australian species: about 50; World species: about 100)

This is a small, mostly tropical and subtropical family of long-legged, narrow-bodied spiders, which are commonly known as Two-tailed Spiders because of the presence of two extraordinarily long spinnerets. They are mostly found on the bark of trees or sometimes under flat stones. When on trees, they do not hide under the bark, but have protective coloration which enables them to be camouflaged on the bark surface. They build small, silken traps nearby to where they rest, which are triggered by the prey and when detected, the spider races quickly and entangles it in silk. These spiders do not normally build webs or silken retreats. When normally at rest on the bark of trees, the spider usually rests dead still with its body and long, legs pressed flat against the bark, with the head facing downwards. The spider will not move until it is almost touched, when it will then lift its body clear of the bark to scuttle swiftly away around to the other side of the trunk, where it rests motionless once again. When it is moving, the spider holds the two long spinnerets upright, to prevent them from being damaged by the rough bark. The main genus in Australia is *Tamopsis*, with about 48 described species. They are mostly found in the arid areas of Western Australia and in the forests and woodlands of eastern Australia. They appear to be absent from Tasmania. *Tamopsis fickerti* (Koch, 1876) is probably the best known species in Australia, and is represented below.



(Plate 141)

Tamopsis fickerti (Koch, 1876)

Description: Most of the body and legs black in colour with brownish and grey-brown bands, blotches and spots on the dorsal surface of the body and abdomen, legs banded in white, grey and dark brown. Males are similar to females but are slightly smaller. Body length: 8-10 mm (males); 10-12 mm (females).

Life history and habits: Little has been recorded on the biology of this widespread species. They are both diurnal and nocturnal in activity and usually live on the bark of *Eucalyptus* trees. During summer the female constructs a broadly oval-shaped egg-sac of white silk measuring 20-25 mm long and about 10-15 mm wide, strongly attached to the outside of the bark. They are difficult to see as the female camouflages them with dirty coloured silk. Mature spiders feed on various small insects, other spiders and ants.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: NSW, Q, V.

Family **Salticidae**

(Australian species: about 380; World species: 5000+)

This is the largest family of spiders in the world with well over 5000 described species, occurring in all habitats both in tropical and temperate regions. They are commonly called jumping spiders because most of the species are very active in warm weather, leaping from leaves, bark, twigs etc, to other resting or jumping posts in the search of prey or to escape from potential predators. Most of the species are brightly coloured while most bark-inhabiting species are dark in colour and mottled with clusters of brown, grey, white and/or black hairs. Some species such as those from the genus *Myrmarachne* mimic ants and are usually black in colour with plain or coloured abdomens matching the colour patterns on the ants bodies which they feed upon. Salticid spiders are usually small; the largest species measure only about 15 mm in total body length, while most species measure between 8 and 12 mm long. They usually have very short legs which are held close to their bodies; the front legs of the male are usually longer than those of the female. The eyes are placed in three rows of 4, 2 and 2 eyes, with the anterior median pair very large. The palps of both sexes are often densely covered with white or grey hairs. The cephalothorax is usually rectangular in shape when viewed from above and the abdomen is usually longer than wide and tapers down to a point. Their acute vision and adept leaping ability have undoubtedly been important factors in their evolutionary success as a group. The spiders actually stalk their prey and then pounce on it at high speed. The last two pairs of legs propel the spider into the air while the prey is seized in the first pair of legs which are usually stronger and more robust than the remaining three pairs. When moving about, salticid spiders usually leave behind a silken thread which acts as a safety line so that the spiders can return to their resting posts or are able to glide down to reach others.

The Salticidae are also the largest family of spiders in Australia, but are mainly predominant in the eastern, wetter and more humid regions of the continent. Over 60 genera have been recorded from Australia, but in a book of this kind, only a relative few can be represented. A total of 14 genera and 18 species are described here. *Astia* is a small,

endemic genus of four species, represented in eastern and western Australia. They are medium-sized, dark brown and black spiders with white and brown breakup patterns on the abdomen and carapace; they are usually nocturnal spiders living under the bark of *Eucalyptus* trees (Myrtaceae). *Bavia* is a small genus of large-sized jumping spiders, two species of which are represented in eastern Australia. They, like *Astia,* are mostly brown in colour, with whitish to grey hairs forming distinctive patterns on the carapace and abdomen; they are mostly nocturnal and hide during the day under the bark of various *Eucalyptus* species. *Helpis* is represented by three endemic species, in eastern and western Australia; they are active during the day on the foliage of broad-leaved plants growing mostly in shaded situations, where the males are involved in complex courtship rituals and aggressive displays towards other males. They feed on a variety of flying insects which land or rest on the broad leaves and the females construct delicate silken retreats which are attached to and hidden under the broad leaf blades. *Holoplatys* and *Ocrisiona* are small, flat, dark brown and black spiders, often adorned with distinctive white, grey and pale brown coloration, forming marked patterns on the carapace and the dorsal surface of the abdomen. They live mostly under the bark of certain *Eucalyptus* trees, where they feed on ants, pseudoscorpions and other small, bark-inhabiting insects. Both genera are endemic to Australia; *Holoplatys* has at least 37 described species, while *Ocrisiona* has at least 8. They occur throughout Australia and Tasmania but are mostly found in the warm, tropical regions of Queensland, the Northern Territory and Western Australia. *Jotus* is a genus of five species restricted to eastern Australia, the majority of species being found in Queensland. They are mostly pale-coloured spiders with black or brown bands on the dorsal surface of the body. Almost nothing is known of their biologies. *Pystira* is represented in Australia by two species in Queensland and New South Wales. Adults are active during he day, hunting on the smooth surfaces of the trunks of various *Eucalyptus*, *Angophora* and other native trees or lower bushes near the ground. *Sigytes* is a tropical genus of at least five species (four in Australia) occurring mostly in northern Queensland, the Solomon Islands, New Guinea and on many other Pacific Islands. Little is known about their biology and habits. *Servaea* is an endemic Australian genus of at least two species of very hairy spiders found commonly in eastern Australia and Tasmania under the bark of various *Eucalyptus* species and other trees. They are mostly nocturnal in activity but become very active if disturbed during the day as well, leaping from tree trunk or other substrate into bark or other debris at or near the base of their host tree where they remain motionless and are usually impossible to detect. The feed on a wide variety of bark-inhabiting insects and other spiders. *Myrmarachne* are strange, ant-mimicking spiders, about 10 species of which have been described from Australia. They are mostly black and brown coloured spiders and most species have a very elongated cephalothorax which is usually divided into two areas by a transverse constriction; the cephalothorax is not structurally divided but the constriction gives an appearance that the body is divided

into three segments instead of two; the purpose of this morphological feature as well as the general coloration and behaviour of the spiders is to give the appearance of an ant, which being an insect, has three body segments. In addition, the abdomen of *Myrmarachne*, which is almost cylindrical in shape, usually has a slight constriction about 1/3 along the length of the abdomen and the resulting shape resembles the shape of some ants abdomens. These are adaptations which enable the spider to hunt ants which are usually aggressive and wary of any insect or ants which belong to other species. The mimicry displayed by *Myrmarachne* thus allows the spiders to mingle amongst, and feed upon, certain species of ants which they most closely resemble, without overt disturbance to the insects. Most of the species are to be found in eastern Australia, usually amongst grass or low vegetation in native habitats. They construct narrow, rectangular retreats on foliage and lay up to 50 orange-red eggs. They are very active during the day, moving along blades of grass amongst foraging ants upon which they feed. The genus *Breda* is represented by only one species in Australia *B. jovialis* (Koch, 1879), an attractive black and orange-brown spider which is widespread over most of the Australian mainland and Tasmania. Like *Bavia* and *Astia*, they are almost exclusively found nesting under the bark of certain *Eucalyptus* species. *Simaetha* are a poorly known group of tropical spiders, mostly with short, robust bodies, and in Australia, they mostly occur in Queensland, where five species have been recorded. They nest in the foliage of various shrubs, especially those with prickly leaves which allow the spider much protection from potential predators. *Opisthoncus* is one of the largest genera of the Australian Salticidae with about 25 described species from Australia. *Opisthoncus* are a taxonomically difficult group with many species, where the males often differ from the females in colour pattern, so much so that the sexes of many species have been described as separate taxa.They are medium-sized to large, brown and black salticids, often patterned on the abdomen with series of zig-zag marks and stripes of white, grey, brown or black. The cephalothorax is often adorned with dorsal white, cream or yellow areas with often reddish to brown markings around the eyes. Most species occur during the day on the foliage of shrubs and bushes, usually close to the ground, while at few other species inhabit bark. They are mostly tropical and sub-tropical in distribution and in Australia, they mainly occur in the eastern half of the continent, but other species occur in Western and South Australia and Tasmania. There is at least one published recorded of a bite from an *Opisthoncus* species. A young man from Murwillumbah, in north-eastern New South Wales, was bitten on the proximal part of the forearm by the spider which was disturbed from foliage while he was gardening at his residential abode. The victim first experienced a very sharp sting at the bite site, and after about 30 minutes, the area began to become inflamed. A narrow-elongate, oval-shaped inflammation, measuring about 22 cm long and 6 cm wide at the widest point (near the bite site) was produced. The whole of the infected area became somewhat oedematic and erythrematic, but showed no signs of necrosis or haemorhagis

(haematoma). The inflamed area was sensitive to touch but was not overly painful. An antibiotic cream was applied periodically which eased the inflammation. The infected area gradually subsided within about a week, but a small, 5 mm diameter swelling, resembling a pimple, remained at the bite site. Periodically over the following nine months, the pimple had grown larger, finally producing a pus exudation, followed by a reduction in size to the post-bite condition. These bite effects were obviously long-lived, and although not life threatening, were still of much annoyance and persistence.

Species from the following genera are represented in this book: *Astia, Bavia, Breda, Helpis, Holoplatys, Jotus, Ocrisiona, Menemerus, Myrmarachne, Opisthoncus, Pystira, Servaea, Sigytes* and *Simaetha.*

(Plate 43)

Astia hariola Koch, 1879

Description: Most of the body and legs black in colour with white hairs forming bands, blotches and spots on the dorsal surface of the body and legs; abdomen with white transverse marks and a pale orange-brown apical region on the dorsal surface. Males are similar to females but are slightly smaller and usually more brightly coloured. Body length: 5-6 mm (males); 6-7 mm (females).

Life history and habits: Little has been recorded on the biology of this species. They are nocturnal and usually live under the bark of *Eucalyptus* trees. During summer the female constructs a broadly oval-shaped egg-sac of white silk measuring 9-12 mm long and about 10 mm wide, attached to the inside of the bark. The egg-sac contains about 40-50, non-glutinous, globular, pale cream eggs, each measuring about 0.6-0.7 mm in diameter. Mature spiders feed on various small insects and ants.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: NSW, Q, Papua New Guinea.

Photograph: Brisbane, Q; collected from under the bark of a *Eucalyptus* sp. (Myrtaceae) and photographed on a leaf; female: 7 mm body length.

(Plate 44)

Astia nodosa Koch, 1879

Description: Body and legs mostly pale orange-brown to reddish-brown with small patches, spots and other marks of darker brown, black and white; abdomen with a series of

darker and pale marks. Immature specimens are usually more orange to reddish-orange than the mature spiders and are usually less heavily marked. Males are similar in colour pattern to the females but are slightly smaller and usually more brightly coloured. Body length: 5-6 mm (males); 6-7 mm (females).

Life history and habits: Little has been recorded on the biology of this species. They are usually nocturnal in activity and mostly live under the bark of various *Eucalyptus* trees. They are sometimes observed running rapidly over the trunks of certain gum trees which match the colour of their bodies. The females construct a broadly-oval to almost rectangular retreat of fine white silk under the bark in which they rest and lay eggs. The egg-sac and early life stages have not been described but are probably similar to those of the related species, *A. hariola* Koch. They feed on a variety of small insects and ants which live and move about under bark.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Toowoomba, Q; female: 7 mm body length.

(Plate 45)

Bavia ludicra (Keyserling, 1882)

Description: Body and legs mostly dark greyish-brown with sparse to dense coverings of white and grey hairs, especially on the legs; abdomen greyish-brown with central dorsal median white mark which is serrated near the apex and a dark reddish-brown band encircling the white mark; the male differs from the female in having a smoother and less hairier cephalothorax, by having the first two pairs of legs much longer and a smaller abdomen with two transverse white marks instead of a broad longitudinal mark. Body length: 9-10 mm (males); 12-14 mm (females).

Life history and habits: Little has been recorded on the biology and behaviour of this species. It is one of the largest species of the Australian Salticidae and is widely distributed in coastal eastern Australia. They are mostly invariably found under loose, straight bark of various species of *Eucalyptus* (Myrtaceae). The eggs and early life stages have not been recorded. The female shown here was collected from an oval-shaped silken retreat measuring 36 mm long by 18 mm wide; the retreat did not contain any eggs. The mature spiders feed on various bark dwelling insects and spiders. The female shown here fed on another salticid (*Ocrisiona* sp.) and other small spiders which were offered in captivity.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V, T.

Photograph: Brisbane, Q; female: 14 mm body length.

(Plate 46)

Breda jovialis (Koch, 1879)

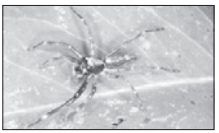
Description: Cephalothorax dark brown to black; abdomen on the dorsal surface black in the anterior half and yellow-brown in the posterior half; legs orange to dark orange-brown in colour; undersurface of the body pale brown and black. Males are similar in colour pattern to females but are slightly smaller. Body length: 6-7 mm (males); 8-9 mm (females).

Life history and habits: Previously little has been recorded on the biology and habits of this species. Adults mature in early summer and occur under the exfoliating bark of certain *Eucalyptus* trees (Myrtaceae). They are brightly coloured spiders which closely match the colour pattern of various species of ants which share their habitats. Like other ant mimicking species of Salticidae, they feed on ants, as well as other small insects and spiders (and their young). They are very wary, difficult to catch and scurry away to cover under bark or debris at the slightest disturbance. The female constructs a broadly circular-shaped egg-sac measuring about 5-6 mm in diameter in a silken retreat measuring about 12-25 mm long by about 10 mm wide. The egg-sac contains 25-40 non-glutinous, dark cream-coloured eggs, each measuring about 0.8-0.9 mm in diameter.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, WA, SA, V, T, NT.

Photograph: Brisbane, Q; female: 7 mm body length.



(Plates 47 & 48)

Helpis minitabunda (Koch, 1880)

Description: Body and legs pale buff-brown with darker orange-brown markings on the cephalothorax; legs with grey bandings. Males differ from the females in colour pattern and have the first pair of legs much longer; cephalothorax dark brownish-black on sides, pale buff-brown dorsally, abdomen mostly pale buff-brown with smaller dark brown areas, legs mostly blackish, each with a white band. Immature specimens are much paler in coloration. Body length: 10-12 mm (males); 11-13 mm (females).

Life history and habits: Nothing has been recorded previously on the biology of this species. Mature spiders usually frequent the leaves of long, broad-leaved plants such as *Pandanus* (family Pandanaceae) and members of the lily family. They rest during the day on the underside of the leaves in a silken retreat or may be observed resting on

the leaf seeking insect prey. They are usually very wary and usually scurry into the shelter of leaf bases in the centre of the plant or move rapidly to the other side of the leaf if disturbed. They prefer the shade and protection of these broad-leaved plants and have not been found by the author in exposed situations away from these plants. The egg-sac and early life-stages have not been described. Food consists of small flying insects such as flies, bees and bugs.

Habitat: Coastal heathlands, woodlands and residential areas.

Distribution: Q, NSW.

Photographs: Brisbane, Q; male: 11 mm body length (Plate 47);
female: 12 mm body length (Plate 48).

(Plate 49)

Holoplatys bicolor Simon, 1901

Description: Cephalothorax dark chocolate brown margined in grey-white; abdomen pale brown bordered in grey-white with two whitish longitudinal marks in the posterior dorsal half; legs dark brown coloured grey-white on the dorsal surfaces. Males are similar to the females but are slightly smaller. Body length: 3-4 mm (males); 5-6 mm (females).

Life history and habits: Commonly called the Pseudoscorpion Spider because of their very flat bodies and their resemblance to pseudoscorpions, which are small arthropods with large claws which live under the bark of certain trees. *Holoplatys* are also well adapted for living under bark and for moving between cracks and crevices in bark. They are rather rare but if encountered and disturbed, they usually become very active and scurry away to another crevice for protection. The egg-sacs and early life stages of this species have not been described. Mature spiders feed on small bark-inhabiting insects and in particular the pseudoscorpions that they mimic.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 6 mm body length.

(Plate 50)

Jotus auripes Koch, 1881

Description: Body whitish to cream with two, broad, longitudinal marks on the carapace of the cephalothorax, and two variable, blackish, median longitudinal lines on the

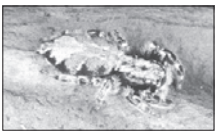
dorsal surface of the abdomen; first pair of legs blue-black, remaining three pairs of legs yellow. Body and legs covered with sparse to moderately dense whitish hairs. Males are similar in colour pattern to the females but are slightly smaller. Body length: 7-8 mm (males); 10-12 mm (females).

Life history and habits: Commonly known as the Black-striped Jumping Spider, this species was originally described from Sydney over 100 years ago but little has been recorded on its biology. This spider appears relatively common in southern Queensland as well as New South Wales where it may be found on the leaves of various species of *Acacia* (Mimosaceae) and *Eucalyptus* (Myrtaceae). The females, like most jumping spiders, are the more commonly encountered of the sexes. They nest in curled up leaves on living plants where they construct a rectangular retreat measuring mostly 15-20 mm long and about 5-8 mm wide. The eggs and egg-sacs have not been described. Mature spiders feed on a variety of small insects such as flies and moths that inhabit foliage.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q. NSW.

Photograph: On the leaf of a *Eucalyptus* species, Brisbane, Q; female: 12 mm body length.



(Plate 51)

Menemerus bracteatus (Koch, 1879)

Description: Body dark chocolate brown to black, covered with short pale grey and pale brown hairs; underside of body black, without dense covering of hairs; legs dark buff-brown with pale grey hairs. Males are similar in colour pattern to females but are smaller. Body length: 9-10 mm (males); 12-15 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behavior of this species. Adults mature in early summer and construct a silken retreat under the bark of various *Eucalyptus* species (Myrtaceae). The retreat is composed of thick, white silk and measures 25-40 mm long by 10-15 mm wide. The female lays 1-3 egg-masses inside the retreat and sometimes more than one female may use a retreat. Each egg-mass contains 10-25 non-glutinous, spherical, orange-pink eggs, each measuring about 0.6 mm diameter. The eggs take 2-3 weeks to hatch and the young spiders often remain within the retreat and with the female for up to two months before dispersing to fend for themselves. Mature spiders feed on a variety of small, soft-bodied bark-inhabiting insects.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 14 mm body length.

(Plate 52)

Myrmarachne striatipes (Koch, 1879)

Description: Cephalothorax and legs black; abdomen black with golden median and apical markings. Males are similar to the females but are slightly smaller. Body length: 5-6 mm (males); 7-8 mm (females).

Life history and habits: Commonly known as the Ant Spider because the coloration of the body mimics those of certain ants which the spider mingles with and feeds upon. The main ants mimicked appear to be members of the genus *Polyrachis* which are often common ants running on the ground, at the base of trees, and amongst low herbage. Spiders have two main body divisions while ants (which are insects) have three, but there is a cleft in the cephalothorax of *Myrmarachne* which gives the impression that there are three segments. In addition, the spider runs on three pairs of legs like an insect and folds the first pair against the body while moving. This disguise appears effective because the spiders move amongst the ants without any aggressive behaviour displayed towards them by the ants. The spiders feed on single ants that may wander away from the main group of ants. The female constructs a small egg-sac measuring about 5-6 mm in diameter under a silken retreat measuring up to 30 mm long and 20 mm wide, under the bark of certain species of *Eucalyptus* (Myrtaceae). The egg-sac contains 15-25 non-glutinous, spherical, pale orange-pink eggs, each measuring about 0.4-0.5 mm in diameter. The young spiders hatch within a few weeks of the eggs being laid and remain for several weeks within the sac before dispersing. They resemble small black ants which move about commonly on the tree trunks and it is probable that *M. striatipes* feeds progressively on several species of ants during its growth.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 8 mm body length.

(Plate 53)

Ocrisiona leucocomis (Koch, 1879)

Description: Body flat; cephalothorax, abdomen and legs mostly dull black, dorsal surface of abdomen with white marks. Cephalothorax with one white line in the male and

two in the female. Males are also slightly smaller than the females. Body length: 8-10 mm (males); 10-11 mm (females).

Life history and habits: This jumping spider is found under the bark of a *Eucalyptus* species (Myrtaceae) where their flat bodies are adapted for moving quickly in the crevices between the bark and the main tree trunk. Little is known of the behaviour of this species. The female produces a white, rounded egg-sac measuring about 6-8 mm in diameter which is covered in a few layers of silk. This acts both as a retreat for the adult spider as well as further protection for the eggs. Each egg-sac contains 25-40, non-glutinous, pale cream-coloured, globular eggs, each measuring about 1 mm in diameter. The mature spiders feed on small bark-inhabiting insects and other small spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: New Zealand, Q, NSW, SA, WA, T.

Photograph: Armidale, NSW; collected from under the flaking bark of a *Eucalyptus* species (Myrtaceae); male: 9 mm body length.

(Plate 54)

Ocrisiona elegans (Koch, 1879)

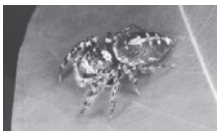
Description: Body flat; cephalothorax, abdomen and legs mostly dull black, dorsal surface of the abdomen with a distinctive pattern of creamy-white marks. Males are similar to females in colour but are slightly smaller. Body length: 6-7 mm (males); 8-9 mm (females).

Life history and habits: Little is known about the biology and habits of this species which is found during summer under the exfoliating bark of certain *Eucalyptus* species. Like many other bark-inhabiting spiders, they are adapted for living in this habitat by having flat bodies that are able to move between small cracks and crevices, while the dorsal surface of the body is cryptically coloured to allow camouflage against the various colours and patterns of bark and to hunt and to escape predation. The female rests during the day in a delicate silken retreat measuring about 15-20 mm long by about 10-15 mm wide. The egg-sacs and early life stages have not been described but these are probably similar to those of the previous species, *O. leucocomis*. The mature spiders feed on various bark-inhabiting insects such as moths and ants and other spiders and their young.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; under bark of a *Eucalyptus* species (Myrtaceae); female: 8 mm body length.



(Plates 55 & 56)

Opisthoncus necator Keyserling, 1881

Description: Cephalothorax and abdomen brownish-black to blackish; carapace with semi-circular whitish to cream mark around the sides and base; abdomen with distinctive white median mark on the dorsal surface. The males are similar in colour pattern to the females but the white marks on the dorsal part of the body are smaller, the abdomen is smaller and more tapered and the front pair of legs is longer. Body length: 10-12 mm (males); 11-13 mm (females).

Life history and habits: Little has been recorded on the biology of this species. The spiders, especially the males, are often common during summer, hunting and dancing on leaves of shrubs during the day. They build a retreat of soft white silk amongst two or more leaves. The males are sometimes observed undergoing threat displays and are very agile in leaping from place to place. The females mature and mate during summer, and each constructs an oval-shaped retreat of soft, white silk on or amongst broad, sheltering leaves of small trees and shrubs. The egg-sac measures 6-7 mm in diameter and contains about 15-25 non-glutinous, pale orange-pink-coloured eggs, each measuring about 0.5-0.6 mm in diameter. They take 3-4 weeks to hatch depending on environmental conditions. The female vigorously guards over the egg-sac. The spiders feed on diurnal flying insects such as flies, bees, wasps and small butterflies and beetles.

Habitat: Dry sclerophyll forests, residential areas.

Distribution: Q, NSW.

Photographs: Nimbin, NSW; male (Plate 55): 11 mm body length;
female (Plate 56): 12 mm body length.


(Plate 57)

Opisthoncus machaerodus Simon, 1909

Description: Cephalothorax, legs and abdomen mostly black; palps, cephalothorax and legs with moderate to dense covering of white and greyish hairs; fringe of white hairs near the front row of eyes and red-brown coloration around eyes; cephalothorax with a central black transverse mark; abdomen bordered in white hairs with a distinctive white cross-like mark near the apex. Males are similar to females in colour pattern but are more slender and have longer front legs. Body length: 10-12 mm (males); 11-13 mm (females).

Life history and habits: Nothing has been recorded on the biology of this species. Like most bark-dwelling salticids, this species probably constructs a silken retreat in which the eggs are deposited.

Habitat: Woodlands, mallee heathlands.

Distribution: WA.

Photograph: 7.5 km north of North Bannister, WA; collected from under bark of a *Eucalyptus* sp. (Myrtaceae); male: 12 mm body length.

(Plate 58)

Opisthoncus polyphemus Koch, 1867

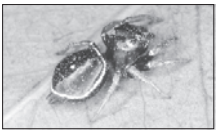
Description: Cephalothorax pale orange-yellow with five distinctive black marks in the anterior half; abdomen yellow with usually some small, darker markings on the dorsal surface; legs orange. Males are similar in colour pattern to the females but are slightly smaller. Body length: 6-7 mm (males); 8-9 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behaviour of this species. Spiders mature in early summer and the females construct a small silken retreat between two leaves of a wide variety of native trees, shrubs and sometimes grasses. The rectangular to irregularly shaped retreat measures about 15-20 mm long by about 6-10 mm wide. The spiders remain in the retreat during the day when not hunting amongst foliage. They are mostly diurnal in activity and feed on small insects and other spiders inhabiting the foliage near their retreats. The egg-sacs and early life stages have not been described.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Nimbin, NSW; female: 8 mm body length.



(Plates 59 and 60)

Pystira orbiculata (Koch, 1881)

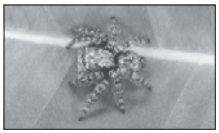
Description: Body above shiny black, cephalothorax with a white mark (sometimes broken into two marks) on the posterior margin; abdomen bordered in cream or white, with a white to cream spot in the centre; legs orange; male is similar to the female but has darker coloured legs, and the body, especially the abdomen, is slimmer. Body length: 7-8 mm (males: 8-9 mm (females).

Life history and habits: The behaviour, egg-sacs and eggs of this species are unknown and have not been described. The adults are active hunters in shady situations and frequent grass or the leaves of shrubs. They feed on small, soft-bodied bugs and flies.

Habitat: Coastal heathlands.

Distribution: Q, NSW.

Photograph: Hastings Point, NSW; male (Plate 59): 8 mm body length; female (Plate 60): 8 mm body length.



(Plates 61)

Servaea vestita (Koch, 1879)

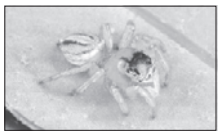
Description: Legs black with dense covering of grey, brown and white hairs, usually forming indistinct bands of varying lengths; cephalothorax and abdomen black, covered in grey, white, black, brown and/or reddish-brown hairs. There is a distinctive, black, inverted Y-shaped mark about the centre of the dorsal surface of the abdomen. Males are similar in colour pattern and size to the females, but have the first two pairs of legs slightly longer than those of the female. Body length: 8-10 mm (males and females).

Life history and habits: This is a very widespread species in eastern New South Wales where it is commonly found under the loose bark of various *Eucalyptus* species and sometimes under the bark of other native trees. Males and females are often found together under one section of bark associated with the egg-sac. They are very active spiders and if disturbed they either run rapidly around to the bark to hide in a crevice or drop to the ground below where they are well camouflaged amongst bark, twigs and other debris. The colour pattern of both sexes is rather variable, ranging from reddish-brown to dark greyish-brown. The female constructs an oval-shaped, white egg-sac measuring 10-12 mm in diameter. Each egg-sac contains 35-50 non-glutinous, pale reddish-brown eggs measuring about 1.0 mm in diameter. The spiders feed on bark dwelling insects such as psocids (booklice), bark bugs, small cockroaches and other small spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, T.

Photograph: Armidale, NSW; collected from under the peeling bark of a *Eucalyptus* species (Myrtaceae); male: 9 mm body length.



(Plate 62)

Sigytes scutulata (Keyserling, 1881)

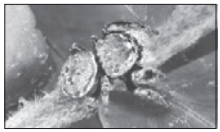
Description: Body and legs buff-yellow to darker buff in colour, the legs usually darker than the rest of the body; cephalothorax black in the anterior half and bordered in yellow buff; abdomen dorsally with yellow buff shades and two central longitudinal black marks extending for most of the length of the abdomen which is pale yellowish-white on the under surface. Males are more slender and smaller than the females. Body length: 5-6 mm (males); 6-7 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behavior of this distinctive but rare species. The specimen shown here was collected from a small, silken retreat measuring about 10 mm long and 7 mm wide amongst leaves of *Pultenaea villosa* (Fabaceae). The egg-sacs and early life stages have not been described. Adults are very agile, can jump considerable distances and are difficult to catch. They probably feed on a variety of small insects and other spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 6 mm body length.



(Plate 63)

Simaetha tenuideus (Keyserling, 1883)

Description: Body and legs mostly golden-brown, densely covered with whitish and grey hairs; abdomen with a few dark spots/flecks on the dorsal surface. Males are similar in colour pattern and size to the females. Body length: 7-8 mm (males and females).

Life history and habits: Nothing previously has been recorded on the biology and behaviour of this species. Spiders mature in late spring to early summer and males and females are often found together in the same retreat. The female constructs an ovoid to irregular-shaped retreat measuring about 10-15 mm long by about 7-10 mm wide of very white silk. The retreat is usually situated in the branches of prickly shrubs such as species of *Oxylobium* and *Daviesia* (Fabaceae). The female lays 30-60 non-glutinous, dark orange-pink eggs, each measuring about 0.5-0.6 mm in diameter. The females and males leave their retreat and the young spiders hatch within a few weeks later. The young spiders remain with the retreat for a short period before dispersing. Mature spiders feed on a

wide variety of small insects such as flies, small native bees and wasps, bugs and other small spiders.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW, Papua New Guinea.

Photograph: Brisbane, Q; female: 8 mm body length.

Family **Sparassidae** (**Heteropodidae**)

(Australian species: about 100; World species: about 1000)

This large, world-wide family contains mostly medium to large-sized spiders commonly (and correctly) called Huntsmen Spiders. They have been incorrectly called Tarantulas, but this name is more correctly applied to the large, hairy spiders belonging to the families Theraphosidae, Ctenizidae and Dipluridae. Some sparassids have also been called Giant Crab Spiders but they differ from the true Crab Spiders (family Thomisidae) in a number of features, not least in their large size, and in other morphological and behavioural characters. Sparassid spiders have laterigrade legs like the unrelated Thomisidae and can run sideways as well as forwards. Their legs are often positioned outwards as well as forwards, and this feature allows them to move under loose bark, stones and in crevices in rocks and man-made buildings with great ease to escape predation or to retreat after hunting.

Huntsmen Spiders normally remain hidden during the day but at the approach of darkness they leave their hiding places to wander in search of food. When suitable prey is encountered, the spider springs upon the prey and administers a strong bite from its powerful, curved fangs. When sexually mature, Huntsmen spiders may spend many hours during the day and night in courtship displays which are interrupted by long periods of rest, when the males remain with the females with their legs overlapping. In some of their elaborate courtships, the male Huntsmen spider may run to meet the female and after touching the female with the tarsi of the first leg, the male then retreats hastily as if alarmed. The male then raises his body high above the substrate and advances towards the female, at the same time shaking his palpi and violently shaking his body. Once more near the female, the male extends the first pair of legs, the female does likewise and may lunge towards the male who then retreats in mock shock! Following this behaviour, the male may chase the female or they both may engage in a slow, sidestepping action with alternating backwards and forwards movements as though they were dancing! Their legs are often raised from the ground and positioned outwards. The male is undoubtedly the main player in these courtship displays. The male palpi are used extensively in drumming the substrate during walking movements while at other times, they are spread apart and outwards and are accompanied with the anterior legs being stretched high in the air. After the male has finished his courtship behaviour, he rests upon the female and mating takes place.

Copulation in Huntsmen spiders usually takes a long time and has been recorded in one species as lasting for between 7-7.5 hours!

The eyes of Huntsmens are arranged in two rows of four and the tarsus of the first and second pairs of legs have a dense brush of short hairs, known scientifically as the scopula, which assists the spider in holding onto steep, smooth surfaces such as walls and ceilings. The males are usually slightly smaller than the females and are readily recognized by having large, club-shaped palps. Huntsmen spiders are able to spend long periods of time without food. In one recorded case, a spider was able to live on only one fly a month!

In Australia, the main genera are *Isopeda* (40 species), *Olios* (25 species), and *Heteropoda* (8 species). The other genera are as follows: *Typostola* (4 spp.), *Pediana* (4 spp.) and *Palytes* (2 spp.); *Delena*, *Anchognatha* and *Pandercestes* are monotypic genera restricted to Australia.

Isopeda is distributed Australia-wide. They are large, flat spiders with long legs and a body length of up to 30 mm. They are often encountered during summer running across ceilings and walls during the nighttime, when they are actively seeking prey. Most of the species of this genus are not harmful to man as they are usually timid and if exposed to light or disturbance, they scurry away sideways to safety into a crevice or in another hiding place. The young spiders usually move much faster than the adults and are more difficult to catch. Because of their large size, long legs and hairy bodies, *Isopeda* species have most often been called (incorrectly) "tarantulas". *Isopeda* are distinctive, brown to grey spiders, the cephalothorax is rounded and the abdomen is oval-shaped; the whole body is flat in side profile (i.e. the body is dorso-ventrally flattened), and is adapted for living in the narrow spaces under bark and in other crevices. The first two pairs of legs are usually longer than the remaining two. Apart from the dark coloration, these spiders may possess patterns of black or dark brown on the dorsal surface of the body and may have lighter-coloured rings on the legs especially near the body. *Isopeda* are comparatively unaggressive and do not bite readily and despite their size and abundance, only a few non-fatal bites to humans have ever been recorded. The effects of the bites are only minor, with local pain persisting for a few days and no significant after-effects. *Olios* are pale-brownish to grey-brown spiders which are easily identified by the colourful markings on the underside of the abdomen. They are usually found on or under the bark of trees and amongst foliage. Some species construct a semi-permanent burrow in the ground and at least one species places a trap-door of silk over the entrance as in the true but non-related, trap-door spiders (families Dipluridae and Actinopodidae). Some *Olios* species construct a silken retreat amongst dead leaves in trees. The female usually guards over the egg-sac until the spiderlings have hatched and dispersed. *Heteropoda* is a small genus of mostly dark brown spiders with darker flecks on the dorsal part of the body. At least one species, *H. cervina* (Koch, 1875), comes into houses where it hides during the day in cracks and crevices, often in dry places under houses. *Pandercestes gracilis* Koch, 1875 is an unusual spider which is mottled grey-green,

brown, grey and black with a body which is very flat. It rests during the day upon the moist, lichen-covered trunks of rainforest trees in northern Queensland and is well camouflaged in this situation. The female constructs an oval-shaped egg-sac measuring about 20 mm long and 15 mm wide which is also camouflaged to match the colours of the lichen-covered bark. Like most Huntsmen spiders, the female of this species remains with the egg-sac until the young have hatched, moulted and dispersed. *Pediana* are mostly rare Huntsmens which have short legs and a very long, broad, oval-shaped abdomen. They are mostly dark grey in colour, mottled with brown and/or black. They are usually found under the bark near the base of trees or in fallen, hollow logs and tree-stumps. Almost nothing appears to have been published previously on their egg-sacs and early life-stages.

The genera represented in this book are *Delena, Heteropoda, Isopeda, Olios* and *Pediana*.



(Plates 64 & 65)

Delena cancerides Walckenaer, 1837

Description: Cephalothorax reddish-brown; abdomen and legs mostly creamy-buff-brown to pale greyish-brown; abdomen with variable pattern of darker grey-brown, wedge-shaped marks or with two irregular horizontal marks or with a few darker grey blotches, or with little or no abdominal patterning. Males are similar in colour pattern to the females but are somewhat smaller. Body length: 20-25 mm (males); 25-32 mm (females).

Life history and habits: Commonly known as the Crab Huntsmen Spider because of its large, crab-like appearance, its often very slow sideways motion between bark crevices and its habit of waving the first pair of legs inwards and outwards if disturbed. They are very similar in behaviour to crabs and like most Huntsmen spiders, do not like disturbance of any kind (c.f. the true Crab Spiders, Thomisidae, most species of which resort to protective coloration and motionless resting upon disturbance). This species is one of the largest of the family in Australia but it is usually not known to be dangerous to humans unless harassed. Although they possess large crushing jaws, which can inflict a painful but not fatal bite, they seem reluctant to bite humans, at least when encountered in their natural habitats in the bush, and are mostly secretive, nocturnal spiders which usually attempt to hide if disturbed. They have been recorded entering houses where they may live for weeks or months as a semi-permanent resident, feeding on insect pests in the houses, such as cockroaches, moths, silverfish, and other spiders, which live behind furniture and on ceilings and walls. Apart from occurring under stones and bark, and under slabs of stones on exposed rocky outcrops in natural habitats, these spiders have also

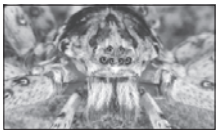
been recorded living under pieces of corrugated iron, and amongst discarded wooden boxes and chopped firewood. This species starred in the movie *Arachnophobia* along with South American bird-eating spiders. The specimens of *Delena* for the movie actually came from New Zealand because Australia would not allow the export of live spiders. Colonies of *D. cancerides* are also most commonly found under sheets of exfoliating bark on dead trees of *Callitris* (Cupressaceae), *Acacia* (Mimosaceae), *Banksia* (Proteaceae) and *Casuarina* (Casuarinaceae). When these trees die, the trunk contracts, leaving a narrow, relatively uniform gap between the bark and the trunk, often around the full circumference of the tree. The spider populations may become very dense in large and extensive stands of their preferred host tree species, especially on *Casuarina* which often occurs densely along rivers and floodplains. Occasionally, *D. cancerides* may be collected from *Eucalyptus* species, particularly in areas where individuals of the related sparassid genus *Isopeda* are uncommon or absent. However, the different patterns of bark exfoliation in *Eucalyptus* results in fewer appropriate nesting sites for *D cancerides*. Solitary individuals are also encountered, and these tend to be primarily adult females, although solitary males and juveniles are also found. *D. cancerides* colonies generally consist of a single female and a number of size classes of juveniles, with some colonies containing up to twelve adults of both sexes and 300 juveniles. In very large colonies, all stages may be present. Colonies which contain multiple size classes appear to have a pyramidal structure, with small spiders the most numerous, and decreasing numbers of successively larger individuals. Bark sheltering the colonies is firmly secured to the tree surface with lines of extremely tough, shiny, golden-brown webbing peculiar to the species. Similar sheets of webbing seal cracks and gaps in the bark. These sheets are water repellent but permit airflow. This distinctive web has been found associated with solitary females of *D. cancerides* but not solitary males or juveniles. In contrast to the very tough, parchment-like, white egg-sacs of *Isopeda, Olios* and *Pediana* (see descriptions for the various species under these genera), the eggs of *D. cancerides* are contained in a fine, more loosely woven silk envelope which is securely anchored flat to the trunk, or occasionally the inner surface of the bark. In colonies with multiple adult females, more than one egg-sac may be present, and evidence of numerous, hatched egg sacs is common. The egg-sac measures 25-30 mm in diameter and contains about 130-180, non-glutinous, almost spherical, dark yellow to orange eggs, each measuring about 1.6-1.8 mm in diameter. The young spiderlings hatch within 2-4 weeks depending on environmental conditions and remain with their mother for many weeks before undergoing one to several moults after which they disperse and fend for themselves. They are defended vigorously by the female until they leave the retreat. The spiders in their natural habitat feed on a wide variety of bark-inhabiting insects and other spiders. In the laboratory *D. cancerides* has been fed moth larvae (*Galleria* species, family Pyralidae: Lepidoptera) and mealworms (*Tenebrio molitor*, family Tenebrionidae: Coleoptera) and

wingless butterflies. In many cases when fed on live Lepidoptera, the prey items were usually subdued by more than one spider, although this appeared to take the form of independent, uncoordinated attacks rather than a concerted, co-operative effort. Spiders pull the prey in different directions before finally settling down to feed from the remains. Often more than one individual feeds on any prey item and small juveniles will frequently crowd the surface of the prey being fed upon. The density of spiders in the nests can be very high and individual spiders are generally in close physical contact with one another. Spiders in the same nests may lie on top of each other in certain harmony. In contrast to this extreme intra-nest tolerance, spiders belonging to foreign colonies are readily attacked, at least in the laboratory. Six distinct chromosomal races of *D. cancerides* have been identified as well as a hybrid population between two of these races. Despite major chromosomal differences, the chromosomal races show little generic divergence at the electrophoretic level.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA, T, and various Pacific Islands close to the Australian mainland including New Zealand. In New Zealand the spider is called the Avondale Spider because of the town in which the spider was first detected. It has only been recently and accidentally introduced to New Zealand.

Photographs: Under the exfoliating bark of a *Eucalyptus* tree (Myrtaceae), Toowoomba, Q; female (Plate 64): 30 mm body length; Under rock, East Mt. Barren, WA; female (Plate 65): 28 mm body length.



(Plates 66 & 67)

Heteropoda cervina (Koch, 1875)

Description: Body and legs generally dark buff-brown with dark brown, grey and black markings on the dorsal surface of the cephalothorax and with brown spots and blotches on the legs which also have variable black hairs; abdomen with variable black marks and spots on the dorsal surface. Males are similar in colour to, and are only slightly smaller than, the females. Body length: 18-20 mm (males); 22-25 mm (females).

Life history and habits: Commonly called the Brown Huntsmen Spider. Although this species was described well over one hundred years ago in 1875, almost nothing has been recorded on its biology and behaviour. Even the egg-sacs and eggs have never been described. The spider illustrated was collected from under a house in a Brisbane suburb between two support beams. Like most Huntsmen spiders, it scurried for cover once disturbed. In native habitats, they live under the bark of various *Eucalyptus* species. This spider feeds on a wide variety of insects (and other spiders) including moths, flies and other insect pests around houses.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW.

Photographs: Brisbane Q; female (Plate 66): 25 mm body length; head of a female (Plate 67).

(Plate 68)

Isopeda immanis (Koch, 1867)

Description: Body and legs mostly greyish-white, with dark brown bands and spots and other marks, generally covered in black and light-coloured hairs; cephalothorax broad, with central portion dark brown; abdomen narrower than cephalothorax with a variable dark brown median longitudinal mark; legs with dark brown spots and variable-sized bands and scattered black hairs. Males are similar to females in colour pattern but are smaller with a narrower abdomen. Body length: 25-32 mm (males); 35-45 mm (females).

Life history and habits: Commonly called the Grey Huntsmen Spider. This species is one of the largest members of the Australian spider fauna and is probably our largest Huntsmen Spider. Like most other species of this family group, the adults hide during the day under the loose bark of various *Eucalyptus*, *Acacia* and other native trees. The female constructs an oval-shaped, flat egg-sac measuring about 25-30 mm in diameter of very white papery silk. Each egg-sac contains about 150-250 pale green to sometimes darker green, non-glutinous, globular eggs, each measuring about 1.5-1.7 mm in diameter. The spiderlings hatch and emerge progressively through one end of the egg-sac and remain with the mother and the egg-sac before dispersing after the first moult. The mature spiders feed on a wide variety of insects and other spiders usually at night.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V.

Photograph: Brisbane, Q; collected from under the bark of an *Acacia* sp. (Mimosaceae); female: 36 mm body length.

(Plate 69)

Isopeda insignis (Thorell, 1870)

Description: Body and legs mostly greyish-white to grey with darker brown to blackish-bands and small spots and other marks; generally covered in black and light-

coloured hairs; cephalothorax broad, brownish, especially in the centre, adorned with grey-white hairs; abdomen usually narrower than the cephalothorax, with variable dark brown to black, transverse marks and small spots. Males are similar to females in colour pattern but are smaller with a narrower abdomen and usually have longer legs. Body length: 25-30 mm (males); 32-40 mm (females).

Life history and habits: Commonly known as the Banded Huntsmen Spider because of the prominent dark transverse marks on the dorsal surface of the abdomen. This species is closely related to *I. immanis* (Koch) but differs in the pattern of the abdomen. Like *I. immanis*, this species is one of the largest of the genus in Australia and is one of our largest spiders. The adults are nocturnal and hide during the day under the loose bark of various *Eucalyptus* trees. They may also venture into houses. The female constructs an oval-shaped, flat egg-sac measuring about 25-30 mm in diameter of very white, papery silk. The females remain guarding over the egg-sac and the spiderlings remain with their mother until after the first moult after which they gradually disperse to fend for themselves. The mature spiders feed on a wide variety of insects such as beetles, flies, cockroaches, moths and other spiders.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA.

Photograph: Brisbane, Q; Under bark of a dead *Eucalyptus* species; female (immature): 15 mm body length.

(Plate 70)

Isopeda villosa Koch, 1875

Description: Cephalothorax brown to dark reddish-brown, covered or partially so, in short, whitish hairs; abdomen pale brown to orange-buff brown with at least four black spots (variable in size) on the dorsal surface and a small black transverse mark at the anterior margin, undersurface of the abdomen darker in colour, mostly-orange-brown; legs covered in various shades of brown with brown and whitish hairs. Males are similar to females but are slightly smaller and have slightly longer legs. Body length: 16-18 mm (males); 18-20 mm (females).

Life-history and habits: Commonly known as the Hairy Huntsmen Spider because of the covering of whitish hairs on the cephalothorax and legs but it is generally not hairier than most other Huntsmen spiders. The adults live under the bark of various *Eucalyptus* species (Myrtaceae) where they rest during the day. The mature female constructs a flat, white, almost circular egg-sac of strong, papery silk, and measures 16-18 mm in diameter and about 3 mm high. It is secured in place with

a number of loose threads and the female rests over the sac until the spiders emerge. They hatch and break through the egg-sac in one position and emerge one by one. They remain with the female and sac until the first moult and shed their skins simultaneously with the assistance of a loose network of silk amongst which they rest, before gradually dispersing. The eggs have not been described. The two egg-sacs collected by the author were empty. The adults are extremely wary and scurry away at high speed up the tree if disturbed. They feed on a wide variety of bark-inhabiting insects and other invertebrates such as beetles, cockroaches, lace-bugs and moths.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 20 mm body length.


(Plates 71 & 72)

Olios diana (Koch, 1875)

Description: Body mostly pale yellowish-brown to buff-brown, the abdomen with several darker brown markings and small brown flecks on the dorsal surface; there is a distinctive black patch on the ventral abdominal surface with two white spots or dashes and an orange stripe towards the apex of the abdomen; this orange stripe may also be bordered by a black, transverse stripe. Males are similar to females in coloration but are slightly smaller with longer legs. Body length: 10-12 mm (males); 12-15 mm (females).

Life history and habits: Commonly known as the Badge Spider because of the distinctive black, white and orange patches on the underside of the abdomen. Little has been recorded on the biology and behaviour of this species despite it being a widespread species. The adults are mostly vagrant hunters which frequent the ground or low bushes seeking prey. During summer the female constructs a rounded egg-sac of white silk which is flattened at the bottom and curved at the top. The egg-sac, which measures 10-12 mm in diameter and about 5-6 mm high, is usually guarded by the female and is hidden under bark on trees or under fallen bark on the ground. The eggs have not been described and the egg-sac shown here with the female (Plate 71) was parasitized by a lacewing. The mature spiders feed on a variety of insects such as moths, beetles and other bark dwelling insects and other spiders.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: WA, SA, V, T, NSW, Q.

Photograph: Brisbane, Q; female (Plate 71); underside of same female showing colour pattern (Plate 72).

(Plate 73)

Olios salacius (Koch, 1875)

Description: Cephalothorax and legs pale orange-brown, abdomen pale yellow-brown to buff-brown, the undersurface with a large blackish triangular mark which is usually intersected by a broad, transverse, white mark; undersurface of legs with alternating black and white marks. Males are smaller than the females, with a slimmer abdomen and slightly longer legs. Body length: 15-16 mm (males); 16-20 mm (females).

Life history and habits: This species usually rests during the day under the bark of trees, or in fallen logs and in hollow, rotten tree-trunks. It sometimes ventures into houses where it rests during daylight hours amongst curtains or behind furniture. The egg-sac and early life-stages have not been recorded but these are probably similar to other Huntsmen spiders. The mature *O. salacius* spiders feed on a large range of insects and other invertebrates such as moths, cockroaches, flies, bark-inhabiting beetles and slaters.

Habitat: Coastal woodlands and dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Townsville, Q; female: 17 mm body length.

(Plate 74)

Olios sp.

Description: Body and legs pale green to darker green, often with two yellow or orange, median spots on the dorsal surface of the abdomen. Males are similar to females in form and colour pattern but are slightly smaller. Body length: 10-12 mm (males); 12-15 mm (females).

Life history and habits: Commonly known as the Green Huntsmen Spider, this species is undescribed, i.e. it has not been formally given a scientific (Latin) name by biologists. The spider is apparently the only green Huntsmen spider known from Australia and it is often common amongst leaves and bushes in native habitats. Unfortunately, almost nothing is known of its biology and the egg-sac and early life-stages are unknown. The females are mostly encountered in curled leaves which are secured with a few silken strands. They are very active and wary during the day and if disturbed, they leap from their retreats to foliage and/or the ground below, where they remain motionless; their green coloration makes them

difficult to detect amongst the grass and other foliage. They fed on small insects and other spiders which inhabit foliage.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; on the leaf of *Acacia leiocalyx* (Mimosaceae); female: 12 mm body length.


(Plates 75 & 76)

Pediana regina (Koch, 1875)

Description: Body and legs mottled with grey, brown and black hairs; cephalothorax with a variable black median, bifid, longitudinal mark on the anterior half of the abdomen and a large wedge-shaped mark toward the apex; underside of body much paler than dorsal, abdomen orange-brown with a broad black transverse mark below the epigastric furrow and bordered in grey-white. Males are similar to females but are slightly smaller. Body length: 15-20 mm (males); 20-25 mm (females).

Life history and habits: Commonly known a the Regent Huntsmen Spider. Almost nothing is known about the biology and behaviour of this rather uncommon species. It is probably one of the most attractive of the Australian species of this family with its distinctive dorsal and ventral colour patterns. They are usually found in or on old logs and tree stumps or under bark at the base of trees. The specimen shown was collected resting amongst leaves of the grass-tree *Xanthorrhoea johnsonii* (family Xanthorrhoeaceae) during daylight hours. Prior to egg-laying, females construct a sealed, web-lined cavity under bark, slightly wider than the female's leg span. In this cavity they produce a parchment-like, lens-shaped egg-sac which is suspended by tough silk threads attached to the bark and tree trunk. They remain in the cavity during incubation and for 2-3 weeks after hatching. The hatchlings congregate on the mother's body for some time until they grow too large to be carried around. The eggs of this species have not been described. The mature spiders probably feed on a variety of bark-inhabiting insects and other spiders.

Habitat: Coastal woodlands, dry sclerophyll forests.

Distribution: Q.

Photograph: Brisbane, Q; female: (Plate 75): 20 mm body length; underside of the same female (Plate 76), showing the colour pattern.

Family **Thomisidae**

(Australian species: about 125; World species: about 2000)

This is one of the largest families of spiders in the world and it contains a very diverse assemblage of species. They are mostly tropical and subtropical in distribution and the majority of taxa in Australia are found in the wetter areas of Queensland and New South Wales. This family is not well developed in southern Australia nor in the drier areas of north-western and central Australia. The majority of thomisids are small to medium-sized spiders, ranging in colour from grey to brown, white to yellow, green to orange, and often ornamented with spots and longitudinal marks. Some species are quite hairy, with associated tubercles and/or spines, but the majority of species are smooth in texture. Most thomisid spiders are characterized by having legs (the first two pairs of which possess ventrally paired spines), which are able to move forwards or sideways (i.e. laterigrade), in a manner similar to that of crabs; hence the popular vernacular name of Crab Spider for the group. They have also been called Aerial or Gossamer Spiders on account of their remarkable ability of transporting themselves from place to place by a silken thread which is blown with the wind and attaches and carries the spider to other supports and retreats. However, this feature is not solely confined to the Thomisidae and the term "Crab Spider" would appear to be a better vernacular when all things are considered. Many species of Thomisidae frequent the ends of branches and flowers of low to high-growing trees or shrubs, while other species live under or on the bark of mature *Eucalyptus, Acacia* and other native trees. Many species form connections between objects, such as twigs and leaves, which are widely separated from each other by long, single threads of silk, while other species conceal themselves amongst herbage, or in the corners of rough bark, rocks or walls. Thomisid spiders do not construct a web, but in order to capture their prey, they rely on concealment, attractive coloration or resemblance (mimicry) to their prey. This adaptive evolution has resulted in a myriad of forms and colours amongst the Thomisidae. A majority of the light-coloured species await in ambush at the centre of flowers, below petals and whole inflorescences, tips of leaves etc., with their anterior legs extended typically sideways and forwards to form half a circle. The eyes of Crab Spiders are arranged in two rows of four, sometimes raised on a tubercle either singly or together as a group. Their anterior eyes are usually larger than the posterior ones. Another remarkable characteristic of Crab Spiders is their ability to move the anterior median eyes in opposite directions at the same time. Male thomisids are usually much smaller than the females and are seldom encountered in the field. The females of most species construct a small, whitish egg-sac on a curved or doubled over, broad leaf or blade of grass, sealed with a thick covering of silk around the margins. The eggs, which may number up to 200 per sac, are white, yellow, pink, green or shades of other colours.

There are three subfamilies represented in Australia. The first of these and the largest, is the subfamily Misumeninae which is represented in Australia by 13 genera. These are typical Crab Spiders with the first two pairs of legs much larger and thicker than the two posterior pairs and are usually adorned with very sharp spines. Their eyes are arranged in two series of four, with the lateral pairs often situated on broad, rounded tubercles or blunt projections. Of this group, the genus *Diaea*, with about 30 Australian species, most of which live on flowers or leaves, is the largest. Most *Diaea* species are small spiders (i.e. less than 1 mm in total length) and they have a distinctive oval to circular, somewhat flattened abdomen, sometimes broader and sharply pointed towards the posterior extremity. Their bodies are usually white, yellow or green, while their abdomens are smooth and coloured white, yellow, pink, orange and are often adorned with spots, marks or lines of red, orange and/or brown. These are perhaps some of our most attractive spiders.

Thomisus is represented by one Australian species, *T. spectabilis* Doleschall, 1859, a distinctive white spider, which as widespread distribution in coastal Queensland and northern New South Wales and is also found in Papua New Guinea, south-east Asia and India. *Runcinia* is a monotypic genus endemic to Australia, its only species being *Runcinia acuminata* (Koch, 1874), a distinctive and attractive spider which is found in eastern Queensland and New South Wales (see later).*Tmarus* is represented by 9 species of small, delicate drab grey, buff and brown spiders, usually with the cephalothorax dotted with cream, brown, grey and/or black marks and spots. They usually sit along the margins of dead or living leaves of ferns or other narrow-leaved native plants; in this position they are well camouflaged. *Monaeses* and *Porrhopsis* are represented by two and four species respectively, both being restricted to northern Queensland. They are poorly known and nothing has been recorded on their biologies and habits. *Bomis* is a monotypic endemic genus, represented by *B. larvata* Koch, 1873, a tiny brown and reddish-brown spider measuring about 2 mm long. *Bomis larvata* is possibly the smallest species of the family in Australia. It occurs in a range of habitats in northern and eastern Australia. Despite its widespread distribution, little is known of its biology. It has been recorded inhabiting the flowers of a daisy, *Senecio vagus* (family Asteraceae) in New South Wales. It constructs a small retreat by folding and securing with silk, a small portion of leaf in which it makes a small egg-sac containing six small near-white eggs. *Corynethrix* is another monotypic genus from north Queensland. Nothing has been recorded on the biology and behaviour of *C. obscura* Koch, 1876. *Cymbacha* contains about 7 species of mainly grey and brown species with large rounded abdomens which are usually ornamented with distinctive patterns of brown and black marks. They are distributed in coastal Queensland and New South Wales. *Tharpyna* with nine species, is another small genus of dark coloured spiders, found mostly in eastern Australia, although least one species occurs in Western and South Australia. They are nocturnal spiders and hide during the day under the protection of bark of

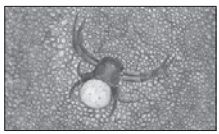
various trees. The mature females rest during the day in a silken retreat under bark where eggs are laid in thin egg-sacs and number up to 40 eggs per batch. Like most Australian Thomisidae, little has been recorded on their biologies and distribution. *Poecilothomisus speciosus* (Thorell, 1881), is the only species of its genus and is restricted to northern Queensland and the Northern Territory. It is one of the most attractive of Australian spiders in having the cephalothorax orange to pale orange-brown, with the legs white to cream, and a white abdomen, which is margined dorsally by a bright orange ring which encloses seven black blotches of varying sizes. *Xysticus* is a world-wide genus closely related to *Diaea* but its species are usually not so colourful as *Diaea* and there are morphological differences between the two genera. It is represented in Australia by about 10 species, but again, they are poorly known and more research is needed on the group. They are mostly confined to Queensland and New South Wales but at least one species is known from Western Australia.

The second subfamily in Australia, the Stephanopinae, is represented by about 6 genera, the largest being *Stephanopis* with about 26 described species. *Stephanopis* spiders are very crab-like in appearance and most species are well camouflaged against the substrates upon which they rest and live, e.g. tree trunks (living or dead) and the stems of bushes and shrubs. Their striking camouflage makes them very difficult to find and hence they are often overlooked by naturalists. They rest during the day with their legs held tightly against the body, with the first three pairs of legs positioned forwards, in crevices of bark or on stems. They are usually only observed upon disturbance when they usually leap to the ground below to be hidden amongst litter and other debris. Most of the species are grey and brown in colour with tubercles possessing spines or hairs on the abdomen. The dorsal surface of the body is often adorned with fragmentary pieces of bark and other debris as a further measure of camouflage. Another distinctive feature of the genus is the eyes, which are situated on a prominent projection at the front of the cephalothorax. The genus is widely distributed in the woodlands and forests of eastern and western Australia. *Hedana* is a small genus of three described species with at least three undescribed species from eastern Australia. They are mostly green spiders with large, flattened abdomens, often adorned with small dark spots. They occur in shaded habitats in semi-rainforest and wet forests where they hide amongst dense foliage and construct a small retreat from a folded leaf secured with strong white silk. They feed on small beetles, ants and moths. *Sidymella* is another small genus of about eight species widely distributed throughout Australia. They are distinguished, among other factors, in having a triangular-shaped abdomen. They are mostly cryptically coloured with pale brown, reddish-brown, orange and yellow coloration on the dorsal surface of the body; the undersurface of the body is pale. They usually frequent foliage and flowers and have a similar ecology and behaviour to that of members of the genus *Diaea*. *Sidymella rubrosignata* (Koch, 1873) is a variable, sexually dimorphic species common in southern Australia. The

colour of the species varies from greenish, to yellow and pale brown, the males are much smaller, hairier and with longer legs. The females mature in summer and construct a white egg-sac in a folded leaf. The female lays 20-35 spherical, cream-coloured eggs each measuring about 1 mm in diameter. *Tharpyna* is a genus of about seven Australian species of dark brown to black spiders with white or cream spots and other markings; they live during the day under bark of trees and little is known of their biology.

The third subfamily, the Dietinae, is represented by only one species in Australia, *Amyciaea albomaculata* (O.Pickard-Cambridge, 1874), which is restricted to northern Australia, and is commonly known as the Green Ant Spider. This species is probably the most remarkable of Australian spiders because of the remarkable resemblance to the Green Tree Ant, *Oecophylla smaragdina* (Formicidae: Hymenoptera). The spider has a yellow to orange or reddish-orange cephalothorax and legs, while the abdomen is pale green to dark green in colour with two dark brown to blackish spots at the posterior end; in addition, the abdomen is spotted with small, rounded, white to cream marks. The spider, when viewed from behind, closely resembles the Green Tree Ant, with the form and colour of the body exactly the same as that of the ant and with the black abdominal marks resembling the eyes of the ant. In addition, the spider continually raises and lowers the first pair of legs in front of the head, like the antennae of the ant. (This behaviour is also known in the ant-mimicking jumping spiders of the genus *Myrmarachne*, family Salticidae). *Amyciaea* spiders are more active at night when they rest in ambush for the ants as they crawl over foliage or along twigs and small branches of the trees in which the ants construct nests. The spider is common in northern Queensland, the Northern Territory as well as in northern Western Australia. The females construct a small, rounded, disc-shaped egg-sac of white silk, usually on the undersurface of a broad leaf of a tree or shrub.

The genera of Thomisidae represented in this book are *Cymbacha, Diaea, Hedana, Isala, Poecilothomisus, Sidymella, Stephanopis, Tharpyna, Thomisus* and *Xysticus*.



(Plate 142)

Cymbacha cerea Koch, 1876

Description: Cephalothorax and legs greyish-brown, abdomen very broadly rounded, flattened, pale yellow-buff on the dorsal surface. Males are similar to the females. Body length: 3-4 mm (males); 4-5 mm (females).

Life history and habits: Very little is known about the biology and life stages of this attractive and interesting species. The silken retreat is the corner of a folded leaf. The adult spiders feed mainly on small bugs such and treehoppers.

Habitat: Rainforests, wet sclerophyll forests, woodlands associated with these two habitats.

Distribution: Q, NSW.

(Plate 143)

Cymbacha festiva Koch, 1874

Description: Cephalothorax and legs dark brown to blackish; abdomen very broadly rounded, flattened, dull creamy buff with intricate pattern of grey, greyish brown and brown marks and dark, variable-shaped blotches on the dorsal surface. Males are similar in colour pattern to the females. Body length: 3-4 mm (males); 5-6 mm (females).

Life history and habits: Very little is known about the biology and life stages of this attractive and interesting species. The silken retreat is the corner of a folded leaf like many Thomisidae. The adult spiders feed on small insects, including ants.

Habitat: Dry sclerophyll forests, woodlands.

Distribution: Q, NSW.

(Plate 144)

Cymbacha saucia Koch, 1874

Description: Cephalothorax blackish with patterns of grey and yellow, legs grey and black; abdomen very broadly rounded, flattened, grey with various and variable patterns of grey, black and/or grey-brown on the dorsal surface. Males with black cephalothorax and more extensive black areas on legs, abdomen brownish with variable pattern of dark blotches and narrow stripes. Body length: 3-4 mm (males); 6-7 mm (females).

Life history and habits: Very little is known about the biology and life stages of this attractive and interesting species. The spider appears to prefer trees growing along river and creek banks in moist areas. The silken retreat is the corner of a folded leaf. The adult spiders feed on small flies, lace bugs, moths, and other small spiders and soft-bodied insects.

Habitat: Rainforests, wet sclerophyll forests, woodlands associated with these two habitats.

Distribution: Q, NSW.

(Plate 145)

Cymbacha ocellata Koch, 1874

Description: Cephalothorax and legs light brown and mottled with grey-brown; abdomen very broadly rounded, flattened, dull yellow with intricate pattern of reddish-brown marks and dark, variable-shaped blotches on the dorsal surface. Males have not been described. Body length: 4-5 mm (males); 6-8 mm (females).

Life history and habits: Again, very little is known about the biology and life stages of this attractive and interesting species. The silken retreat is the corner of a folded leaf like many Thomisidae. The adult spiders feed on small insects.

Habitat: Dry sclerophyll forests, woodlands.

Distribution: Q, NSW.

(Plate 77)

Diaea evanida (Koch, 1867)

Description: Cephalothorax and legs pale to darker green; abdomen broadly rounded, flattened, dark cream to bright yellow, with distinctive red and white marks and various punctures coloured red, pink, white or yellow on the dorsal surface; this abdominal pattern is variable in terms of the amount of red coloration and its intensity; the size of the red spots or marks on the abdomen are also variable and often absent. Males are similar in colour pattern to the females. Body length: 4-5 mm (males); 6-8 mm (females).

Life history and habits: This is one of the most common Crab Spider in eastern Australia. It occurs on a large number of shrubs and flowers both in natural habits and in residential areas; it is often common in orchards and on fruit trees (especially citrus) growing in home gardens, where the coloration of the cephalothorax and legs matches that of the *Citrus* leaves. If disturbed, they either flick to the other side of the leaf or drop on a silken thread to the ground or leaf below. The female constructs a shiny, white egg-sac measuring about 5-8 mm in diameter, usually on the underside of a leaf and is rigorously guarded by the spider. The egg-sac contains 20-40 translucent, whitish to cream eggs, each measuring 0.8-1.0 mm in diameter. The adult spiders feed on small flies, lace bugs, moths, and other small spiders and soft-bodied insects.

Habitat: Heathlands, woodlands, residential areas.
Distribution: Q, NSW, V.
Photograph: Nimbin, NSW; female: 7 mm body length.


(Plate 78)

Diaea pilula (Koch, 1867)

Description: Cephalothorax and legs dark green, portions of legs with a brown to black tinge; abdomen bright yellow to orange with darker orange to orange-red marks and spots (which are variable). Males are similar in colour pattern and general morphology to females. Body length: 3-4 mm (males); 4-5 mm (females).

Life history and habits: Little has been recorded on the biology of this species. The female constructs a small, circular egg-sac of white silk measuring about 5 mm in diameter in the corner of a folded leaf. The deep cream-coloured, globular eggs each measure about 0.7 mm in diameter and number 25-30 per sac. The mature spiders feed on a variety of insects, such as flies, moths and small bees.

Habitat: Woodlands, dry sclerophyll forests.
Distribution: NSW.
Photograph: Galston Gorge, Sydney, NSW; female: 5 mm body length, feeding on a native bee (*Leioproctus* sp., family Colletidae).


(Plate 79)

Diaea variabilis Koch, 1875

Description: Cephalothorax and legs pale greenish-white to cream, abdomen cream with variable brown spots and sometimes larger marks towards the posterior margin of the abdomen. Males are similar to females in colour pattern but are smaller with narrower abdomens. Body length: 4-5 mm (males); 6-7 mm (females).

Life history and habits: This is a fairly widespread species in eastern Australia and is usually found on the white flowers of a number of native flowers including those of *Tristania, Melaleuca* and *Leptospermum* (Myrtaceae) and *Actinotus* (family Apiaceae) as well as a number of white flowering introduced plants in residential gardens, especially in the Sydney region. On the petals of these white flowers, these spiders are well camouflaged and if accidentally disturbed, they usually rapidly drop on a

silken thread to the ground or to another branch or leaf below. The female constructs a flat, broadly oval-shaped egg-sac of white silk, measuring 8-10 mm long and 6-8 mm wide. It is usually placed under a leaf. The sac is covered by a dense network of loose silk. Each egg-sac contains 25-30, non-glutinous, pale cream-coloured, globular eggs, each measuring 0.7-0.8 mm in diameter. The females remain with the eggs until they hatch within two weeks of being laid. The mature spiders feed on small soft-bodied insects such as flies which land on the flowers that the spiders are using as ambush sites, as well as other spiders.

Habitat: Coastal heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; collected from the white flowers of a *Melaleuca* species (Myrtaceae) and photographed on a fern frond; female: 7 mm body length.

(Plate 80)

Hedana gracilis Koch, 1874

Description: Body and legs light emerald green; abdomen narrow with a number of small dark spots on the dorsal surface; abdomen mostly green but sometimes with an apical yellow patch. Males are similar to females but are slightly smaller. Body length: 4-5 mm (males); 5-6 mm (females).

Life history and habits: Commonly known as the Green Crab Spider. The coloration of this spider merges in with the leaf coloration of a number of native and introduced plants. After mating in early summer, the female spider constructs a retreat by folding the end portion of a leaf back onto itself thereby creating a pyramidal space in which the egg-sac is deposited. The end of the leaf is secured with white silk. The oval-shaped egg-sac measures about 6-8 mm long and 5-6 mm wide and is composed of soft white silk. Each egg-sac contains 40-60 globular, non-glutinous, very pale green eggs each measuring about 0.6-0.7 mm in diameter. The female closely guards the egg-mass by resting over the eggs within the leaf retreat. The eggs hatch within two weeks and the spiderlings remain in the retreat for a few days before dispersing, often on gossamer threads. The mature spiders feed on a wide variety of small insects, including flies and moths.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Hastings Point, NSW; collected from a retreat made at the end of a leaf of *Acacia sophorae* (Mimosaceae); female: 6 mm body length.

(Plate 81)

Isala punctata Koch, 1876

Description: Cephalothorax dark orange-red to pale reddish-brown with a broad, longitudinal, median black mark; abdomen yellow-brown to reddish-brown, with a large number of small black spots; legs orange-brown to reddish-brown and black. Males are similar in colour pattern to the females but are smaller. Body length: 5-6 mm (males); 10-12 mm (females).

Life history and habits: Commonly known as the Spotted Isala Spider because of its scientific name and the presence of the numerous black spots on the dorsal part of the abdomen. This species is apparently a rare spider and very few specimens have ever been collected. The specimen illustrated here was collected from the leaf bases of the grass-tree, *Xanthorrhoea johnsonii* (Xanthorrhoeaceae) during summer, along with an immature female spider which displayed similar but paler coloration to that of the adult spider. Mature spiders have been recorded eating flies and the specimen shown ate small moths that were offered to it in captivity.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 12 mm body length.

(Plate 146)

Poecilothomisus speciosus (Thorell, 1881)

Description: Cephalothorax very broad and elevated, pinkish with dark blotches and other markings; legs white to cream; abdomen rounded, white in the centre with orange to orange-pink margins and with series of 4 pairs of black blotches of varying sizes.The males are unknown. Body length: 10-12 mm (females).

Life history and habits: Very little has been recorded on the biology and habits of this spider. It usually is found amongst trees growing along creek banks.Their food consists of a wide range of insects including moths and plant bugs such as leaf hoppers.

Habitat: Wet sclerophyll forests, tropical woodlands.

Distribution: Q.

(Plate 147)

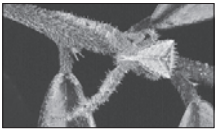
Runcinia acuminata (Koch, 1874)

Description: Cephalothorax with very broad, distinctive dark chocolate-brown stripe on the sides, divided by a narrow pinkish brown stripe; abdomen long, narrow-oval shaped with two broad cream, longitudinal stripes on the dorsal surface and with a number of narrower pinkish-brown stripes on the lateral margins; some irregular blotches and other marks in the centre. Males are similar in colour pattern to the females but are much slimmer. Body length: 5-6 mm (males); 9-10 mm (females).

Life history and habits: These spiders often occur commonly on the brown seed heads of grasses, sedges and bulrushes where their colour pattern provides them with adequate camouflage against predation. The egg sacs are hidden amongst the seeding heads of the grasses. The spiders feed mostly on small moths which also live amongst the grasses

Habitat: Woodlands, grasslands, agricultural areas.

Distribution: Q, NSW, Papua New Guinea.



(Plate 82)

Sidymella hirsuta (Koch, 1873)

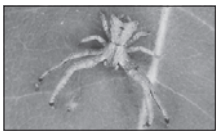
Description: Legs dark brown, cephalothorax and abdomen reddish-brown to dark brown; dorsal surface of body and legs densely covered in pale to dark brown spines; underneath of body pale buff brown to greyish-brown; abdomen is prominently triangular in shape and is somewhat flattened and variable in colour. Males are similar to females but are smaller with narrower abdomens. Body length: 4-5 mm (males); 6-7 mm (females).

Life history and habits: This is a rare species which appears restricted to coastal ecosystems. The spiders live on certain native plants with hairy leaves and stems and in this situation, they are well camouflaged. From these cryptic resting positions, they capture small flies, bugs and other small insects landing upon or moving over the host plants. The egg-sac and eggs of this species have not been described.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; on the leaves of a *Hovea* species (Fabaceae); female: 7 mm body length.



(Plate 83)

Sidymella lobata (Koch, 1874)

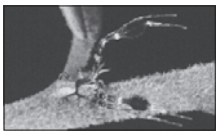
Description: Body and legs dark buff-brown to chocolate brown; abdomen trapezoidal in shape, with two lobes at the apical end. Males are similar in colour to the females but are slightly smaller. Body length: 3-4 m (males); 4-5 mm (females).

Life history and habits: This Crab Spider is apparently more common in certain areas of New South Wales but it is secretive and is rarely observed. Consequently little has been recorded on its biology and behaviour and the egg-sacs and early life-stages are unknown. Mature spiders live amongst litter and in other debris close to or on the ground in moist, sheltered situations. They may also rest on or catch prey from leaves of low shrubs and bushes. They feed mostly on small insects which live amongst leaf litter and rest on low, broad-leaved plants.

Habitat: Dry sclerophyll forests, rainforests, vine thickets.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 5 mm body length.



(Plate 84)

Stephanopis barbipes Keyserling, 1886

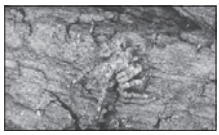
Description: Body mostly dark grey-brown to brown, first two pairs of legs very long, black-banded, each with a series of long, black bristles on the tibia in the male; all legs with scattered, black hairs of varying lengths. Females are slightly larger than the males and lack the bristles and black banding on the first two pairs of legs. Body length: 3-4 m (males); 4-5 m (females).

Life history and habits: Little has been recorded on the biology of this species, which is widely distributed from Cape York Peninsula, through western coastal New South Wales and Victoria, and also occurs in Tasmania. It prefers shaded situations amongst ferns and grasses or amongst litter at or near the base of trees. The egg-sacs and eggs have not been described. They feed on small bugs, flies and other tiny soft-bodied insects. The males await in ambush at the ends of leaves with their bristly front legs outstretched and are thus easily identified.

Habitat: Heathlands, woodlands, Melaleuca swamps, dry sclerophyll forests.

Distribution: Q, NSW, V, T.

Photograph: Brisbane, Q; male: 3-4 mm body length.



(Plate 85)

Stephanopis altifrons O.Pickard-Cambridge, 1869

Description: Body and legs dark greyish-brown to dark brown, with grey, grey-brown and black specks of colour and irregular-sized protuberances; cephalothorax about the same width as the abdomen. Males are similar in colour pattern to the females but are smaller. Body length: 5-6 mm (males); 7-8 mm (females).

Life history and habits: Commonly known as the Bark Spider because of the coloration and texture of the dorsal surface of the body and legs which give the spider the appearance of a portion of bark or other debris. These spiders are mostly nocturnal in habits and during the day they rest with the legs tightly folded against their bodies, under or on bark where they are well camouflaged. The spiders mature in spring to early summer. The female constructs an irregular-shaped egg-sac which measures about 7-8 mm in length and is usually deposited in a crevice amongst the bark and may also be camouflaged with small pieces of bark fibres and other debris. The egg-sac contains 25-35, translucent, off-white, non-glutinous, spherical eggs, each measuring about 1 mm in diameter. The mature spiders feed mainly on other spiders.

Habitat: Woodlands, wet and dry sclerophyll forests.

Distribution: Q, NSW, V, SA.

Photograph: Nimbin, NSW; on the bark of a *Eucalyptus* species (Myrtaceae); female: 7.5 mm body length.

(Plate 86)

Stephanopis ornata Koch, 1875

Description: Body and legs grey, greyish-brown to dark brown, with grey, grey-brown and black specks and protuberances on the dorsal surface; abdomen much wider than the width of the cephalothorax; dorsal surface of the abdomen with darker markings near and at the posterior margin. Males are similar in colour pattern to the females but are smaller. Body length: 4-5 mm (males); 7-8 m (females).

Life history and habits: Commonly known as the Ornate Bark Spider because of the distinctive (but variable) pattern on the dorsal surface of the abdomen. Like the

previous species of *Stephanopis*, they are cryptically coloured and are well camouflaged against the bark of trees upon which they live. The female constructs a flattened, irregular-shaped egg-sac of dull-white silk which is placed under loose bark or in a crevice and is usually camouflaged with bark and other debris. The eggs and early life stages have not been described. The mature spiders feed on small insects and other spiders under or on bark.

Habitat: Woodlands, dry and wet sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 8 mm body length.

 (Plate 87)

Tharpyna campestrata Koch, 1874

Description: Body and legs mostly dull black, portions of legs, cephalothorax and abdomen adorned with reddish-brown bands, spots and marks, legs with cream and grey spots and blotches; abdomen with brown, orange, cream and dull yellow marks and spots; some specimens have a purplish tinge. The males are similar in colour pattern to the females, but often have more blotches and spots.

Life history and habits: These are nocturnal Crab Spiders which rest during the day under the bark of a number of *Eucalyptus* species (especially those trees with freely peeling thin bark). The species is widespread and often common in the drier areas of central Queensland and western New South Wales. The females construct an oval-shaped egg-sac of white silk measuring about 8-10 mm long and 5-7 mm wide, attached to the underside of the peeling bark of eucalypts. The creamy, non-glutinous eggs each measure 0.8-1.0 mm in diameter and number 30-40 per egg-sac. When disturbed, the adults rapidly move to cover under bark where they often remain for long periods in suspended animation until danger passes. Other times they may also drop suddenly to the ground upon disturbance where they hide amongst loose leaf litter, bark and twigs where they are well camouflaged. They feed on a variety of insects, including small cockroaches, bugs (especially leaf-hoppers), small beetles and other small bark-dwelling insects.

Habitat: Woodlands.

Distribution: Q, NSW, NT, WA.

Photograph: Armidale, NSW; collected from under the peeling bark of a mature *Eucalyptus* species; female: 12 mm long.

(Plate 88)

Tharpyna albosignata Koch, 1876

Description: Body and legs mostly blackish-brown; abdomen flat, rounded, with three white spots at the middle of the lateral margins and the apex; a larger white, median mark is situated on the anterior margin of the abdomen. Males are similar in colour pattern to the females but are slightly smaller. Body length: 4-5 mm (males); 5-6 mm (females).

Life history and habits: Little has been recorded on the biology and behaviour of this species. The adults are usually active under bark at night where they feed on small insects such as leafhoppers and other bugs, small spiders and ants. The egg-sacs and early life stages have not been recorded.

Habitat: Woodlands, dry and wet sclerophyll forests.

Distribution: Q, NSW.

Photograph: Nimbin, NSW; collected from under the bark of a *Eucalyptus* tree (Myrtaceae); female: 6 mm body length.

(Plates 89 & 90)

Thomisus spectabilis Doleschall, 1859

Description: Cephalothorax and legs pale buff-white to cream, with white bands and/or marks; abdomen broadly triangular, white, with distinctive indentations on the upper surface and with black marks on the corners of the abdomen. Males are much smaller than the females and are often yellow-brown to dark orange-brown in colour. Body length: 2-3 mm (males); 10-12 mm (females).

Life history and habits: This species is commonly known as the White Crab Spider. The female produces an egg-sac composed of very white silk, the upper layers of which are very smooth. It measures about 12-16 mm in diameter and encloses 200-400 non-glutinous, globular eggs. These eggs are frosty white to cream in colour and measure about 1 mm in diameter. The species occurs in the warm parts of Australia and is common in eastern Queensland but is less common in northern New South Wales, its apparent southernmost range. Females commonly occur on white flowers and amongst leaves of various native plants where they wait in ambush for flies, beetles, bees and other diurnal flying insects; it has also been recorded feeding on other spiders in its natural habitats. In north-eastern Queensland, the spiders have been reported feeding on the Green Tree Ant (*Oecophylla smaragdina*, family Formicidae: Hymenoptera).

Habitat: Woodlands, heathlands, dry sclerophyll forests.

Distribution: Q, NSW, NT, Papua New Guinea, Indonesia, India.

Photograph: Brisbane, Q; on flowers of a *Melastoma* species (Melastomataceae); female (Plate 89): 12 mm body length; Hastings Point, NSW; on flowers of *Baeckea stenophylla* (Myrtaceae) with a calliphorid fly (Diptera: Calliphoridae); female (Plate 90): 12 mm body length.

 (Plate 91)

Xysticus bilimbatus Koch, 1867

Description: Body pale to dark buff-brown; cephalothorax with two darker, longitudinal marks near the lateral margins; abdomen various shades of brown with two darker, longitudinal bands on the dorsal surface of the abdomen. The brown coloration is somewhat variable, especially on the dorsal surface of the abdomen. Males are similar in colour pattern to the females but are slightly smaller. Body length: 3-4 mm (males); 6-7 mm (females).

Life history and habits: Nothing previously has been recorded on the biology of this secretive species. Mature adults are usually found on the ends of leaves and branchlets of various native plants often amongst dead leaves or dark yellow or dead flowers where they appear to be well camouflaged. The egg-sacs and early life stages have not been described, although it is known that the egg-sac is contained within a small retreat, which is comprised of flowers (e.g. *Pultenaea* species, family Fabaceae) which are fastened together with silk. Mature spiders feed on flies and other air-borne insects attracted to the flowers upon which the spiders rest, and probably other small spiders.

Habitat: Heathlands, woodlands.

Distribution: Q, NSW.

Photograph: Hastings Point, NSW; female: 7 mm body length.

 (Plate 148)

Xysticus geometres Koch, 1874

Description: Cephalothorax and legs mostly dark brown to blackish; abdomen moderately rounded, flattened, dull creamy buff with intricate pattern of grey, greyish brown and brown marks on the dorsal surface. Males are similar in colour pattern to the

females but often have darker abdominal patterns. Body length: 5-6 mm (males); 6-8 mm (females).

Life history and habits: Very little is known about the biology and life stages of this attractive and interesting species. The silken retreat is situated under bark on trees. The adult spiders feed on small insects, including ants.

Habitat: Dry sclerophyll forests, woodlands.

Distribution: Q.

Family **Araneidae** (**Argiopidae**)

(Australian species: about 260; World species: about 2800)

This large, cosmopolitan family contains spiders commonly known as Orb Weavers, some of which are very common and well known. Most members of the family construct orb webs but in several genera, no web is built and capture of prey is accomplished by direct hunting (e.g. *Arcys*, *Archemorus*) or by the use of a special thread at the end of which is a sticky droplet which is used by the spider to hit moving prey (e.g. the Bolas Spider, *Dicrostichus*). The family exhibits a wide variation in size, colour, shape and behaviour and contains some of the largest and most colourful spiders known. Some species measure only 2 mm in body length when mature, while the largest members of the family, belonging to the genus *Nephila*, measure up to 50 mm in body length.

About 30 genera and 260 species have been recorded from Australia and no doubt many others await discovery and scientific description. The largest genus in Australia in terms of the number of species, is *Eriophora* (= *Araneus*) which is represented by about 110 species. They are mostly grey, brown and black spiders, sometimes with colourful patterns of white, red, orange and/or yellow on the abdomen. Some species are green with yellow stripes while others are orange with brown or black markings. They are mostly nocturnal and hide during the day amongst foliage near their webs. The Scorpion-tailed Spiders of the genus *Arachnura*, of which there are at least three Australian species, have distinctive, elongated, tapering abdomens which are often curled around over the cephalothorax like that of a scorpion. They rest head downwards in the centre of the web below a series of elongated brown egg-sacs and are usually well camouflaged in this position since their bodies are also pale brown in colour. The genus *Arcys* contains at least six species of brightly coloured spiders with triangular abdomens. They are mostly orange to orange-red in colour with variable-sized white spots bordered in black on the dorsal surface of the abdomen. They are found in woodlands and dry sclerophyll forests throughout eastern Australia and one species occurs in Western Australia. They do not build an orb web but ambush prey at the ends of leaves of bushes and trees. *Argiope* are usually large spiders commonly known as St. Andrews Cross Spiders because one

species rests on a stabilamentum, which are two broad, zig-zig, silken ribbons which intersect at the centre of the web upon which the spider rests with its legs outstretched. The genus is well represented in the tropical regions of the world and about 20 species have been described from Australia. There is marked sexual dimorphism in this genus with the male usually much smaller and of different coloration to that of the female. *Cyclosa* is represented by about six species in eastern and western Australia. They are mostly black spiders with colourful patterns on the dorsal surface of the abdomen which often terminates in large, rounded tubercles. The function of these tubercles is unknown. The spiders usually make their webs close to the ground in shady, sheltered situations. *Cyrtophora* are commonly known as Tent Spiders or Tent-building Spiders because of the shape of their webs. Their webs are not like those of other orb weavers since they are woven very intricately in a horizontal plane and hoisted up in the centre with many support threads so that the orb now resembles a marquee tent with a large hollow area in the centre and in the top of which the spider rests upside down. In at least one species, *C. hirta* Koch, 1872, the spider rests inside a dense silken retreat which is attached to the top of the orb web. There are at least six Australian species of the genus, found mostly in tropical regions. The Christmas or Jewel Spiders, of the genus *Gasteracantha* (10 Australian species) are perhaps the most bizarre and most colourful of the Australian Araneidae. They occur throughout most of Australia but are also more common in tropical regions. They are brightly coloured with yellow, orange, red, white and black and have a variety of black spines on the abdomen. The mature adults are usually observed during mid-summer (December) hence the popular name of Christmas Spider for the group. The genus *Leucauge* is represented by two Australian species which are coloured yellow, green, silver and black; they have smooth abdomens without spines and have pale green legs. They usually make their webs close to the ground against long grass and shrubs, often in shady situations by creeks etc. The genus *Phonognatha* is represented in Australia by at least three species. They are commonly known as Leaf-curling Spiders since they place a dead, curled leaf in the centre of their webs which acts as a retreat and a protective container for the egg-sac. Both males and females live separately in curled leaves until summer when the male leaves his retreat to locate a female. When one is found, the male lives in the female's leaf until mating occurs. *Nephila* are large (at least the female is) tropical spiders commonly known as Golden Orb Weavers because of their large webs built of strong golden silk. They are often common throughout eastern Australia and especially in tropical areas where their webs are often a hazard for bushwalkers. The spiders usually build the webs in woodlands and dry sclerophyll forests often high up in trees and even under awnings of houses and amongst electricity wires. About eight species have been recorded from Australia. *Poecilopachys* is a small genus of about three species native to eastern Australia. They are very colourful with two sharp spines on the large

rotund abdomen. The genus *Poltys* contains dark grey and pale brown spiders which rest during the day on dead twigs of trees and are thus well camouflaged. There are at least nine species ranging across the continent.

The following genera are represented this book: *Arachnura, Archemorus, Arcys, Argiope, Celaenia, Cyclosa, Cyrtophora, Dicrostichus, Eriophora, Gasteracantha, Leucauge, Nephila, Phonognatha, Poecilopachys* and *Poltys.*

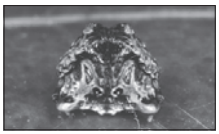
(Plate 92)

Arachnura higginsi (Koch, 1872)

Description: Cephalothorax small, hidden by at least two enlarged processes at the anterior end of the abdomen; abdomen broad in the anterior portion, narrowing to a smaller apex; body pale buff-brown to dark grey-brown, with irregular white to cream marks, especially on the lateral margins of the abdomen; colour differs markedly with the age of the spider, immature spiders range from pinkish-brown, dark pink, orange-brown and dark yellow. Males are much smaller than the females and lack the elongated tail of the female abdomen. Body length: 2-3 mm (males); 13-16 mm (females).

Life history and habits: Commonly known as the Tailed Spider or the Scorpion-tailed Spider because of the shape of the female abdomen which terminates into a group of four, tiny, spine-like processes and which may be raised and curled over the body like a scorpion's attack posture. The usually inclined or sometimes horizontal orb web of this species is strung between branches of low trees usually close to the ground and it varies in size with the age of the spider. Two upper portions of the web usually lack a spiral thread. On the radial line of the orb between these two open areas, the female constructs a row of elongated egg-sacs which is built up over a period of several weeks. The female spider rests during the day with legs retracted and the tail pointed upwards in the centre of the web at the end of the line of egg-sacs, where it is well camouflaged, its colour matching that of the egg-sacs. The new spiderlings hatch in early summer and mature in mid- to late summer. After hatching, they move from the parental web and later occupy individual sites amongst small bushes and low branches of trees. The young females at first do not have an elongated abdomen but have a broadly triangular abdomen which lengthens progressively with each moult. The immature spiders place pieces of bark, small leaves and leaf fragments, twigs, dead insects, excreta of various larval insects and other debris in a row along the radial line at the top of their webs at the sites where they will later construct their egg-cases. Mature spiders feed on a wide variety of insects including bugs, flies, mosquitoes and soft-bodied insects.

Habitat: Woodlands, dry sclerophyll forests, residential areas.
Distribution: Q, NSW, V, SA, WA, T.
Photograph: Brisbane, Q; female: 15 mm body length.

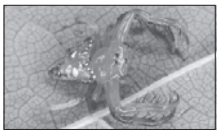

(Plate 93)

Archemorus curtulus Simon, 1893

Description: Body and legs coloured various shades of brown and black. Males are similar to females but are slightly smaller with longer legs and slimmer abdomens. Body length: 5-6 mm (males); 6-7 mm (females).

Life history and habits: Commonly known as the Bird-dropping Spider because it rests motionless with legs retracted and held close to the body on the upper surfaces of leaves of various broad-leaved rainforest plants where it resembles a dropping of a bird; the colour pattern is quite striking. The egg-sac and early life-stages have not been described but these are probably similar to that of a related species, *A. simsoni* Simon, 1893. In this species, the female builds a spherical-shaped egg-sac which is covered with layers of loose, fluffy, white silk and is suspended on silken threads. The egg-sac contains about 40-50 whitish, non-glutinous eggs, each measuring about 0.5-0.6 mm in diameter. *Archemorus* feed on small insects such as moths and flies and occasionally prey on other small spiders.

Habitat: Wet sclerophyll forest, rainforest.
Distribution: NSW, Q.
Photograph: Mt. Glorious, Q; female: 7 mm body length.


(Plate 94)

Arcys lancearius Walckenaer, 1837

Description: Body bright orange-red, somewhat paler on the ventral surface (and sometimes the cephalothorax); abdomen triangular-shaped, brightly coloured, dorsally with two large yellow, median spots and 2-4 small pale yellow to white spots situated below the larger ones; a series of white to cream spots bordered in black are situated around the margins of the abdomen; underside of abdomen usually dark red without spots; eyes black and first two pairs of legs very short and narrow; there is apparently a dark (melanic) form of this species with the body reddish-black to dark reddish-brown and the abdomen margined with black; the colour

spots on the abdomen are similar to those of the typical form. The males are similar to the females in colour pattern and form but are slightly smaller. Body length: 5-6 mm (males); 7-8 mm (females).

Life history and habits: Commonly known as the Triangular Spider or Jeweled Spider because of the distinctive shape of the abdomen and its associated colour pattern. This is perhaps the best known and most widespread member of the genus but it is not very common and almost nothing is known about its behaviour and biology. The female constructs a spherical, deep creamy-pink to orange-pink egg-sac measuring about 8 mm in diameter which is densely covered in a mass of very loose silken threads. The sac is attached to the underside of leaves usually closer to the ground by a number of very strong threads. The yellow eggs measure about 0.6-0.8 mm in diameter; there are about 70-75 eggs per egg-sac and they are suspended in a glutinous ball. The egg-sac is constructed in late summer (January to February) and the spiderlings emerge about 5 weeks later. Mature spiders feed on small soft-bodied insects such as lace bugs and small moths and their larvae which feed on leaves. At other times, the spiders wait patiently with the first two pairs of legs outstretched for flies and other air borne insects to come their way.

Habitat: Woodlands, dry sclerophyll forests, heathlands.

Distribution: NSW, Q, T, Papua New Guinea.

Photograph: Hastings Point, NSW; female: 8 mm body length.

(Plate 95)

Arcys cornutus Koch, 1871

Description: Cephalothorax dark red to maroon; legs pale orange-yellow to dull yellow, the tarsi of the first two pairs of legs mostly crimson; abdomen triangular, mostly dark red to crimson with an orange tinge and bordered with yellow and orange; series of whiter spots of variable size circled in black on the dorsal surface of the abdomen; first two pairs of legs with numerous, anteriorly directed, long black spines. Males are similar to females, but are slightly smaller and usually more brightly coloured. Body length: 5 mm (males); 5-6 mm (females).

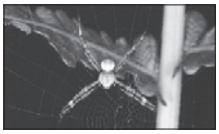
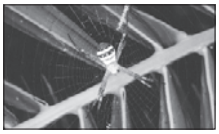
Life history and habits: Commonly known as the Cornute Triangular Spider because of the two prominent spines on the anterior margin of the cephalothorax near the eyes. Little has been recorded on the biology of this species. The mature spiders feed on small insects such as flies, bugs and moths by grasping the prey with the first two pairs of legs which bear numerous spines adapted for the purpose. They are commonly found during the day at the ends of leaves of various native trees and bushes lying in wait for passing prey. If disturbed, they usually leap from their

resting posts and glide downwards on a silken thread before scurrying away to cover under another leaf or similar retreat. The egg-sac and early life stages have not been described.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Hastings Point, NSW; male: 5 mm body length.



(Plates 96 & 97)

Argiope aetherea (Walckenaer, 1837)

Description: Cephalothorax brownish with a dense covering of short, silvery hairs; abdomen broad with bands of yellow, red, brown and white on the dorsal surface; legs greyish-brown with a few orange-brown and black bands. The male is much smaller and drabber in coloration than the female and the brown abdomen is without bands. Body length: 5-6 mm (males); 15-18 mm (females).

Life history and habits: Commonly known as the St. Andrews Cross Spider because the female constructs an X- shaped, hackled cross or stabilamentum which consists of two, broad ribbons of silk which intersect in the centre of the web. The female rests head downwards on the stabilamentum with two legs placed together on each of the four arms of the cross. *Argiope aetherea* is the best known species of the genus and probably is the most familiar and colourful spider of the family in Australia. Immature female spiders construct a small orb web with a very delicate, lacy stabilamentum. Male spiders do not construct a stabilamentum. During the mating season, the male seeks the female and remains on the outskirts of the web until the female is ready for mating. The female is very aggressive towards the male before she is ready to mate and if the male approaches too soon, he is often attacked. As a means of survival and escape, the male often displaces one of his legs as a diversion while he scurries away to safety. Males are often observed hanging upside down on webs with one or more legs missing. The females are easily disturbed and usually drop to the ground or foliage nearby at the slightest provocation. Each mature female constructs one or two pear-shaped, slightly flattened egg-sacs measuring about 30-40 mm long by about 16-20 mm wide at the widest point. The sac is greyish-white to greenish in colour and usually placed in or near vegetation close to the margins of the web. Each egg-sac contains 200-300, glutinous, spherical, light brownish-coloured eggs, each measuring about 0.7-0.8 mm in diameter. The eggs take about 2-3 weeks to hatch and the young spiderlings remain with the sac and web until the first moult, after which they gradually disperse. Mature spiders feed on a variety of insects such as flies, bees, bugs and small beetles.

Habitat: Heathlands, woodlands, dry sclerophyll, forests, residential areas.

Distribution: Q, NSW, NT.

Photographs: Brisbane, Q; male (Plate 96): 6 mm body length;
female (Plate 97): 17 mm body length.

(Plate 98)

Argiope extensa Rainbow, 1897

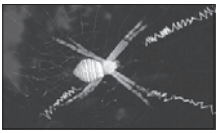
Description: Cephalothorax and abdomen silvery-white; abdomen with variable, dorsal, orange-brown markings on the lower half; legs orange-brown to dark buff-brown with darker brown to blackish bands. The males have never been described. Body length: 10-12 mm (females).

Life history and habits: Little has been recorded on the biology and habits of this rare spider which sporadically occurs throughout the southern half of Australia. The females mature in summer and construct one to three oval-shaped egg-sacs each. Each egg-sac is composed of dirty-white silk, often with tufts of greenish-coloured silk scattered randomly over the external surfaces; it measures 8-10 mm long and 5-7 mm wide. Each egg-sac contains 60-80, pale yellow, spherical, glutinous eggs, each measuring about 0.6-0.8 mm in diameter. The eggs take 2-3 weeks to hatch and the young spiders stay with the egg-sac until after moulting and later dispersing. The mature spiders feed on a variety of flying insects such as flies, beetles, grasshoppers, bees and butterflies.

Distribution: NSW, V, SA, WA.

Habitat: Woodlands, heathlands, dry sclerophyll forests.

Photograph: New Norcia, WA; adult spider feeding on a specimen of the jewel beetle, *Astraeus polli* (family Buprestidae: Coleoptera); female: 10 mm body length.



(Plate 99)

Argiope trifasciata (Forskoel, 1775)

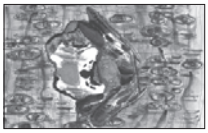
Description: Cephalothorax brown with a dense covering of short, silvery hairs; dorsal surface of abdomen with silver, yellow and black bands; legs brownish with black and whitish bands; undersurface of abdomen patterned with brown, yellow and black. Male much smaller with duller coloration than the female. Body length: 4-5 mm (males); 16-22 mm (females).

Life history and habits: Commonly known as the Three-banded Cross Spider. Although not as common as *A. aetherea*, this spider also has a widespread distribution, mostly in coastal tropical regions. The female spider builds a small orb web up to about 25 cm in diameter, which is suspended amongst grass or reeds usually in shady situations along creek banks. A stabilamentum may or may not be built in the centre of the web. During mid-summer the female constructs a large, flattened, oval shaped, pale brown egg-sac measuring about 35-40 mm in length. The egg-sac is usually placed at one side of the web usually amongst foliage where it may be camouflaged. The eggs take 2-3 weeks to hatch and the new spiderlings remain with the sac and the web until the first moult. The egg-sac contains 150-200 globular, non-glutinous, pale cream-coloured eggs, each measuring about 1 mm in diameter.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW, NT, V, T, Polynesia, North America, Papua New Guinea, Africa.

Photograph: Brisbane, Q; female: 22 mm body length.



(Plate 149)

Celaenia kinbergi Thorell, 1868

Description: Body and legs of various shades of black, brown and cream in a complicated pattern. Males have not been described. Body length: 2.5-3 mm (males); 10-12 mm (females).

Life history and habits: Commonly known as the Bird Dung Spider and Orchard Spider. The spider does not build a web snare, but attracts male moths by the use of pheromones as the spider hangs upside down from a leaf. It grasps its prey with the first and second legs which are armed with heavy black spines. It appears that the spider makes a type of pheromone which attracts the females of a single species of moth. The spider constructs a dark brown globular egg-sac with black blotches. Little else has been described on the biology of this species.

Habitat: Woodlands, dry sclerophyll forests, orchards, agricultural areas.

Distribution: Q, NSW, V, T, SA.

(Plate 100)

Cyclosa trilobata (Urquhart, 1885)

Description: Body and legs mostly black, sometimes with white and brown blotches on the lateral margins of the body; abdomen long in relation to the rest of the body,

terminating in three blunt, rounded protuberances, the central one of which is the largest; abdomen mostly black but with median dark orange to reddish, variable mark; this mark is variable in size and shape and may also be silver or black and white instead of orange. Males are similar to females in colour pattern but are smaller with shorter lobes at the end of the abdomen. Body length: 5-6 mm (males); 8-10 mm (females).

Life history and habits: Little has been recorded on the biology of this spider. The female builds a small orb web usually near ground level in a shady position amongst ferns and bushes. The spider places a perpendicular line of food debris wrapped in silk through the centre of the orb web. Mature females construct a rounded, conical-shaped, pale orange-brown coloured egg-sac measuring about 8-10 mm in length by about 6-8 mm wide, usually attached to a stem of a plant, outside but close to the web. Each egg-sac contains 45-60 non-glutinous, spherical, yellow-brown eggs each measuring about 0.8 mm in diameter. Mature spiders feed on a variety of small insects such as flies, mosquitoes and small beetles.

Habitat: Woodlands, heathlands, dry sclerophyll forests.

Distribution: Q, NSW, V, T, New Zealand.

Photograph: Hastings Pont, NSW; female: 10 mm body length.

(Plate 101)

Cyclosa bifida (Doleschall, 1859)

Description: Body and legs mostly dark brown to blackish; abdomen very long in relation to the rest of the body with distinctive cream, yellow and black markings on the dorsal surface and sides. Males are similar to the females but are slightly smaller with shorter abdomens. Body length: 5-6 mm (males); 8-9 mm (females).

Life history and habits: Little has been written on the biology and behaviour of this spider. The female constructs a small orb web amongst foliage of bushes and shrubs; it usually has a vertical band of debris down the center, on which the spider aligns its body when resting in the centre of the web. After mating, the female constructs a rounded, spherical-shaped, pale orange-coloured egg-sac measuring about 6-8 mm in diameter, usually attached to a stem of a plant or to a dead twig, outside but close to the web. The egg-sac contains about 40-50 non-glutinous, spherical, yellowish-brown eggs, each measuring about 0.7 mm in diameter. The mature spiders feed on a variety of small insects such as flies and mosquitoes which fly into the web.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: NT, Q, NSW, WA, Papua New Guinea, India.

Photograph: Perth, WA; female: 9 mm body length.

(Plate 102)

Cyclosa bacilliformis Simon, 1908

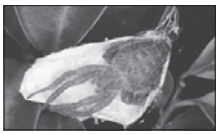
Description: Cephalothorax and legs black with white marks; abdomen rectangular in shape, mostly black with white spots on the lateral margins and undersurface; dorsal surface bright orange-yellow in the upper half, black and white in the lower half. Body length: 4-5 mm (males); 7-8 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behaviour of this rare species. Its life history is probably similar to that of other *Cyclosa* species.

Habitat: Heathlands, woodlands.

Distribution: WA.

Photograph: Perth, WA; female: 7 mm body length.



(Plate 103)

Cyrtophora exanthematica (Doleschall, 1857)

Description: Body and legs orange-brown to greyish-brown, the legs often lighter coloured than the rest of the body; abdomen flat, broader in the upper half and tapering to a blunt point at the apex. Males are similar in colour pattern to the females but are somewhat smaller. Body length: 10-12 mm (males); 15-18 mm (females).

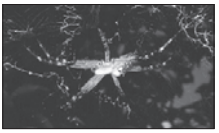
Life history and habits: Nothing previously has been recorded on the biology and behaviour of this spider, which may be called the Brisbane Garden Spider. This is a fairly distinctive species because of its rather flat body and abdomen. The spiders construct an extensive horizontal, bowl-shaped web with a large number of support threads in small trees and low bushes, usually about 1-2 metres above ground level. The male spider rests within its retreat or rests flat on its egg-sac amongst a thin web and empty space enclosed and protected by a number of curled leaves held together with silken threads. The egg-sac is held in place by silken threads in the centre of this accessory retreat. The egg-sac measures 25-30 mm long, 8-10 mm wide at the widest point and about 7-8 mm deep. The egg-sac is very flat on top and rounded on the other side and tapered at both ends. Sometimes the egg-sacs which are of strong white silk, have several rounded blobs of greenish silk attached to the outer surfaces. The egg-sac contains 500-700, spherical, non-glutinous, pale orange-coloured eggs, each measuring about

0.5-0.6 mm in diameter, tightly packed within the egg-sac. The young spiderlings hatch within a few weeks (depending on environmental conditions) and remain with the female and sac. They stay within the leaf retreat for some time after moulting and later dispersing. The mature spiders feed on a wide variety of small insects which become caught in the main web, such as flies, bees, beetles, grasshoppers and small butterflies.

Habitat: Woodlands, dry sclerophyll forests, residential gardens.

Distribution: Q.

Photograph: Brisbane, Q; female: 17 mm body length.



(Plates 104 & 105)

Cyrtophora moluccensis (Doleschall, 1857)

Description: Cephalothorax dark brown with a dense covering of short, silver-white hairs; legs mostly brown with irregular bands of black and grey, white and pale brown; abdomen large in relation to the rest of the body, mostly white and yellow with variable patterns of black, maroon and white in the centre of the dorsal and ventral surfaces of the abdomen. Immature spiders are mostly greenish and yellow in colour with numerous white and black spots, blotches and other marks. Males are much smaller than the females with narrower abdomens and with duller coloration. Body length: 4-5 mm (males); 18-25 m (females).

Life history and habits: Commonly known as the Tent Spider because of the extensive funnel-shaped web that this species (and related ones) construct. The huge, intricate web of this species may measure up to 1.5 metres in diameter and sometimes the web becomes communal as a result of a number of webs merging in the one area. These communal webs are often situated high in trees and may extend for up to 5 metres in diameter. As such, these spiders are perhaps the most extensive web builders amongst the Australian spider fauna. Although distinctive, the webs of *C. moluccensis* are not easily recognized like those of the orb weaving spiders. The webs are closely woven in a horizontal plane, usually close to the ground. They are uplifted and secured in the centre so that a broad cone-shaped web is produced which is connected by a large number of support threads. The mature female spider rests upside down on the top of the cone amongst the intricate webbing. If part of the web is disturbed, the female moves quickly away to cover. During the night it searches over the web for insects that have become entangled in the fine, but strong, mesh of silk. During summer the female constructs a relatively large egg-sac measuring about 25-30 mm long by about 15-20 mm wide, of greyish-white to brownish

silk covered in loose, fluffy brown to dark brown silk on the outer surface. The egg-sac contains 500-700 non-glutinous, globular, pale yellow-coloured eggs, each measuring about 0.7-0.8 mm in diameter. The eggs hatch within 2-3 weeks and the young spiderlings remain on the web until the first moult, after which they gradually disperse. Mature spiders feed on a wide variety of insects, including beetles, bugs, flies and bees.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, Polynesia, Torres Strait, Papua New Guinea.

Photographs: Brisbane, Q, in a residential garden; female (Plate 104): 25 mm body length; egg-sac (Plate 105) opened to show the colour and arrangement of the eggs inside.

(Plate 106)

Cyrtophora hirta Koch, 1872

Description: Cephalothorax and legs dark brown with black bands on the legs and darker brown marks on the cephalothorax; abdomen creamy-pink to pale pink with brown marks and short, broad rounded tubercles on the lateral margins and with at least six dark spots in the centre of the dorsal abdominal surface. Males are smaller and more slender than the females. Body length: 5-6 mm (males); 10-12 mm (females).

Life history and habits: Little has been recorded on the biology of this Tent Spider. The female constructs an intricate orb web which is pulled up in the centre into a short funnel; the web has a large number of support threads and is usually situated at the base of shrubs or strung between bushes and low trees near the ground. In the centre of the funnel there are usually leaf fragments, twigs and other debris as well as various items of prey wrapped in silk. The spider rests during the day in the centre of the funnel where it is well camouflaged amongst the tangle of debris etc and web material. The female constructs a somewhat flattened, slightly convex egg-sac measuring about 8-10 mm in diameter, of greenish-white silk with tufts of greenish-coloured silk attached to the outer surface. Each egg-sac contains 45-50 non-glutinous, globular, pale cream coloured eggs, each measuring 0.7-0.8 mm in diameter. The mature adults feed on a wide variety of insects which stray and fly into their intricate webs, including flies, moths, beetles, grasshoppers and small cicadas.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female (with egg-sac): 10 m body length.

(Plate 150)

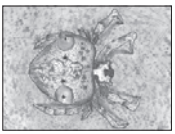
Dicrostichus furcatus (O.Pickard-Cambridge, 1877)

Description: Body pale grey buff with dense reticulate pattern of white on the dorsal surface, relatively large white areas on small smooth tubercles on the abdomen, densely hairy. Males have not been described in detail. Body length: 2-3 mm (males), 10-12 mm (females).

Life-history and habits: Little has been written on the biology of this species. Females are usually found associated with the egg-sacs which are dark buff-brown in colour and are hung in a small cluster wrapped in silk amongst dead leaves; they taper at each end but are more rounded at the bottom and are widest in the middle. They feed exclusively on moths.

Habitat: Woodlands, heathlands, dry sclerophyll forests, residential areas.

Distribution: NSW.



(Plate 151)

Dicrostichus magnificus Rainbow, 1897

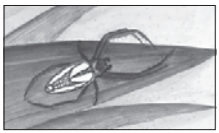
Description: Body pale grey buff with a pattern of orange star-shaped to irregular marks on the dorsal abdomen with two large yellow tubercles on the dorsal surface. Males have not been described in detail. Body length: 2-3 mm (males), 10-12 mm (females).

Life-history and habits: Commonly known as the Bolas Spider. Little has been written on the biology of this species. Females are usually found associated with the egg-sacs which are dark buff-brown in colour and are hung in a small cluster wrapped in silk amongst dead leaves; they taper at each end but are more rounded at the bottom and are widest in the middle. They feed exclusively on moths. These moths are captured during the evening by the spider by using a bolas constructed of strong, somewhat elastic silk. The spider dangles from a horizontal silken line and lowers a silken thread of silk, about 5 cm in length, towards the ground. The thread is beaded with sticky droplets along some or all of its length with extra large ones near the end of the bolas. When a moth approaches within range, the spider starts whirling the thread in a circular motion, lets it fly and ensnares the prey on the sticky thread. Then it acts like a

fisherman bringing in a large fish, by reeling the line in and letting it out a lesser distance before, until the prey is exhausted, and dangles helplessly. The moth is then hauled up and eaten.

Habitat: Woodlands, heathlands, dry sclerophyll forests, residential areas.

Distribution: NSW.



(Plate 152)

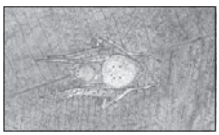
Eriophora bradleyi (Keyserling, 1887)

Description: Cephalothorax and legs mostly dark buff-brown with a dense covering of sharp, black spines; abdomen shiny white with enamel-like texture with a complicated central pattern of yellow-brown, grey and darker brown. Males are similar to females in colour pattern. Body length: 5-6 mm (males); 12-15 mm (females).

Life history and habits: This attractive araneiad has a wide distribution over southern eastern Australia. It constructs a flimsy net web amongst native shrubs usually in shady habitats near creeks or amongst ferns. The egg-sacs are plano-convex and have an outer cover of copper-coloured flocculent silk. The spiders feeds on small insects caught in their webs, such as flies, mosquitoes, beetles and moths.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: NSW, V, T.



(Plate 153)

Eriophora circulissparsus (Keyserling, 1887)

Description: Cephalothorax pale green, abdomen yellow-green and legs greenish-buff with black spines and scattered finer, whitish hairs. Males are similar to females in colour pattern but are more slender. Body length: 3-4 mm (males); 5-7 mm (females).

Life history and habits: This greenish spider is seldom noticed as it is nocturnal in habits and during the day it is well camouflaged against the leaf surfaces upon which it rests. The spider appears to prefer small trees and scrub vegetation along creek banks. Little has been recorded on the biology of this interesting cryptic species.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: NSW, Q.

(Plate 154)

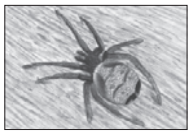
Eriophora parvulus (Rainbow, 1901)

Description: Cephalothorax and legs pale brown, the legs with bands of light grey hairs; abdomen large in relation to the rest of the body, brown with a complicated pattern of yellow, black and brown, these being variable in hue and size from one individual to another and is not sex-linked. Males are similar to females in colour pattern but are much smaller. Body length: 3-4 mm (males); 4-6 mm (females).

Life history and habits: This attractive spider is usually found in low bushes in its natural habitat especially *Lantana camara* (Verbenaceae). The female usually constructs a tangled web and two or more egg-masses amongst the leaves. The rounded, convex egg-sacs are covered in loose, light brown silk and measure 9-12 mm in diameter. The female remains with the sacs in a semi-exposed situation until they hatch. The eggs and early life stages have not been recorded. The mature spiders feed on a variety of small, soft-bodied insects which are caught in their flimsy webs.

Habitat: Woodlands, dry sclerophyll forests, heathlands.

Distribution: NSW, Q.



(Plate 155)

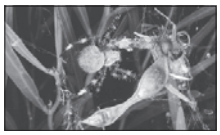
Eriophora praesignis (Koch, 1871)

Description: Cephalothorax and legs greenish brown with a dense covering of short, dark grey-brown hairs; abdomen with a very complicated pattern of black blotches, brown spots and irregular marks and some yellow patterns. Males are similar to females in colour pattern but are more slender. Body length: 4-5 mm (males); 7-8 mm (females).

Life history and habits: Almost nothing has been described on the biology and habits of this distinctive but rare spider which appears confined to north-eastern Queensland. The spiders feed on small flying insects.

Habitat: Rainforest, wet sclerophyll forests.

Distribution: Q.



(Plates 107 & 108)

Eriophora transmarina (Keyserling, 1865)

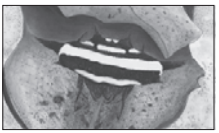
Description: Body brownish, densely covered in white and grey hairs; colour pattern of the abdomen is very variable, ranging from shades of brown, red-brown, orange-red to almost black, with patterns of white, grey and/or orange-brown in the centre; usually there is a leaf pattern on the dorsal surface; the abdomen has two blunt rounded tubercles near the anterior margin and one similar tubercle near the apex of the abdomen. Males are similar to the females and display similar colour variation but are slightly smaller with more slender abdomens. Body length: 15-17 mm (males); 20-25 mm (females).

Life history and habits: Commonly known as the Garden Spider or the Garden Orb Weaver because it is often common in residential gardens in eastern Australia. This species is one of the largest in the genus. Mature spiders construct a distinctive, relatively large, vertical orb web which usually has a large space in the centre. This orb, which may measure up to 0.7 mm in diameter (and excluding the length of the major support threads) is usually strung between two trees or amongst low bushes, at about 1-2 metres above ground level. In certain areas and situations, the spiders are often very common, and in natural habitats, bushwalking can often be hazardous as a result of large numbers of webs being built across walking tracks at or about head height. If disturbed upon the web, the spider scurries up or across a support thread and retreats into nearby foliage. The orb web is often demolished in the morning and reconstructed during the following evening; the spiders usually become active near dusk. Before mating, the sexes come together for a non-elaborate courtship. The male usually hangs downwards on a special mating thread, with the undersurface of the body facing that of the female. The male strokes the female, which rests motionless with the legs retracted and hunched over the cephalothorax, with the front pair of legs. The male continues touching the cephalothorax and legs of the female until interrupted by reciprocal treatment from the female. This courtship behaviour may last up to 30 minutes before mating takes place. The female constructs an oval-shaped, greyish-green egg-sac which measures about 25-30 mm long by about 15-20 mm wide. Each egg-sac contains about 200-300 cream-coloured, non-glutinous, globular eggs, each measuring about 1 mm in diameter. The mature spiders feed on a wide variety of insects such as bees, beetles, grasshoppers, bugs and mosquitoes. They are thus very important in reducing garden and household pests and the presence of these harmless spiders around the home should be encouraged.

Habitat: Woodlands, heathlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA, NT, T.

Photographs: Brisbane, Q; female (Plate 107): 22 mm body length; 128 km east of Southern Cross, WA; female (Plate 108) 24 mm body length.



(Plate 156)

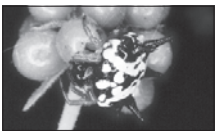
Gasteracantha fornicata (Fabricius, 1775)

Description: Cephalothorax and underside of body black, abdomen greatly enlarged laterally, with three black lateral spines on each side; dorsal surface patterned with yellow; this pattern is variable in shade and extent while the abdominal spines are often variable as well. Males are much smaller than the females and are mostly black with yellow markings. Body length: 3-4 mm (males); 8-10 mm (females).

Life history and habits: Almost nothing is known about the biology and behaviour of this most attractive and interesting species, but most of these aspects are probably similar to those of *Gasteracantha minax*. This species was apparently the first spider species described and named from Australia. The type specimen was most certainly collected by either J. Banks or C. Solander while they were on the famous Captain James Cook expedition of 1770 and was probably collected from the Endeavour River near the present town of Cooktown. The early life-stages are unknown. The egg-sac is oval in shape, measures 12-15 mm in diameter at the widest point and is composed of green, flocculent silk. The food is probably small flying insects which become caught in their webs.

Habitat: Woodlands, dry rainforests.

Distribution: Q, Papua New Guinea, Polynesian and other Pacific Islands.



(Plate 109)

Gasteracantha minax Thorell, 1859

Description: Cephalothorax black with short, sparse, silver hairs; abdomen very large in relation to the rest of the body, with three pairs of large, black spines of various lengths at the posterior margins and sides; dorsal surface of abdomen patterned in broad contours and blotches of white and yellow and with a few orange patches; undersurface of abdomen mostly black with small, irregular yellow spots and

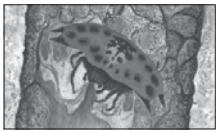
marks. Males are much smaller than the females and are mostly black with small yellow and white marks; the abdomen has short, blunt spines. Body length: 3-4 mm (males); 8-10 mm (females).

Life history and habits: Commonly known as the Christmas or Jewel Spider (also Spiny Spider) because of the striking and beautiful colour pattern on the abdomen and because of the fact that females are usually prevalent during Christmas time in Australia (i.e. December). This is perhaps one of the most interesting and beautiful of Australian spiders. The females are usually solitary in a delicate, vertical wheel web (consisting of a close spiral), but sometimes the spiders may be found in dense aggregates with many webs overlapping and contacting others. The female spider normally rests in the centre of its orb which is usually constructed in tall grass or amongst low bushes, not usually more than about one metre above ground level. A characteristic feature of the web of this species is the presence of small balls of loose white silk which are placed on the radial strands of the web. The female constructs a variable-shaped egg-sac of reddish-brown silk which measures about 20-25 in length and about 12-15 mm in diameter at the widest point. It is usually thicker in the centre and tapers towards both of the ends and is secured with dark reddish-brown silken threads to a twig or leaf of a plant adjacent to the web. The egg-sac contains 120-160 dark yellow, non-glutinous, nearly spherical eggs, each measuring 0.7-0.8 mm in diameter. Mature spiders feed on a wide variety of flying insects such as small beetles, flies, bugs, mosquitoes and flying termites.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: WA, SA, Q, NSW, V, NT,T.

Photograph: Toowoomba, Q; female: 10 mm body length.



(Plate 157)

Gasteracantha quadrispinosa O.Pickard-Cambridge, 1879

Description: Cephalothorax and underside of body black, abdomen greatly enlarged laterally, with two black spines on each side; dorsal surface mostly dark orange red to darker red, patterned with yellow and black in the centre. Males are much smaller than the females and are mostly black with red markings. Body length: 2.5-3 mm (males); 5-6 mm (females).

Life history and habits: Nothing is known about the biology and behaviour of this most attractive and interesting species, but these aspects are probably similar to those of *Gasteracantha minax*. The egg-sac is oval-shaped and attached to a twig and has an outer covering of flocculent cream silk. The eggs number 40-50 per egg-

sac and are cream in colour. The food is probably small flying insects which become caught in their webs.

Habitat: Rainforest, wet sclerophyll forests.

Distribution: Q, NSW, Papua New Guinea.

(Plate 158)

Gasteracantha taeniata (Walckenaer, 1837)

Description: Cephalothorax and underside of body black, abdomen greatly enlarged laterally, with two black spines on each side and two black spines at the apex; dorsal surface mostly dark yellow, patterned with black bands. Males are much smaller than the females and are mostly black with yellow markings. Body length: 2.5-3 mm (males); 8-9 mm (females).

Life history and habits: Nothing is known about the biology and behaviour of this most attractive and interesting species, but these aspects are probably similar to those of *Gasteracantha minax*. The food is probably small flying insects which become caught in their webs.

Habitat: Rainforest, wet sclerophyll forests.

Distribution: Q, NSW, Papua New Guinea, Falkland Islands.

(Plate 159)

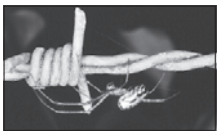
Gasteracantha westringi Keyserling, 1863

Description: Cephalothorax and underside of body black, abdomen greatly enlarged laterally, with three reddish to red-brown apical spines on each side; dorsal surface patterned with yellow, red and blue; this pattern is variable in shade and extent while the abdominal spines are often variable as well. Males are much smaller than the females and are mostly black with yellow and red markings. Body length: 3-3.5 mm (males); 7-8 mm (females).

Life history and habits: Nothing is known about the biology and behaviour of this most attractive and interesting species, but these aspects are probably similar to those of *Gasteracantha minax*. The early life-stages are unknown. The food is probably small flying insects which become caught in their webs.

Habitat: Woodlands, semi-arid areas.

Distribution: Q,NT, Norfolk Island.



(Plate 110)

Leucauge dromedaria (Thorell, 1881)

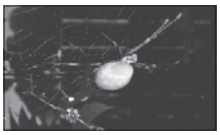
Description: Cephalothorax buff-brown, yellow-brown to orange-brown (greenish to yellow-green in immature specimens), often darker on the anterior half; abdomen long in relation to the rest of the body, cylindrical, mostly silver with a distinctive and somewhat variable black pattern on the dorsal surface and dark brown to black on the ventral surface; legs yellow-brown with darker brown and black banding; femurs of the fourth legs with characteristic curved bristles. Males are similar in colour pattern to the females but are much smaller. Body length: 4-6 mm (males); 10-15 mm (females).

Life history and habits: Commonly known as the Two-humped Orb Weaver or the Camel Spider because of the prominently humped anterior portion of the abdomen which bears a pair of black tubercles. Females construct a moderate-sized, horizontal web measuring about 20-40 cm in diameter (not including the length of support threads) usually amongst shady trees and bushes or near the ground in long grass and low shrubs usually in moist situations such as along shady creek banks. The orb web has a hole at the hub upon which the spider rests, usually upside down. The egg-sacs and early life stages have not been described. The mature spiders feed on a wide variety of small insects such as flies, moths, bugs and beetles that become ensnared in the web.

Habitat: Woodlands, dry sclerophyll forests, wet sclerophyll forests, rainforests, residential areas.

Distribution: Q, NSW.

Photograph: Mt. Glorious, Q; female: 10 mm body length.



(Plate 111)

Nephila ornata Rainbow, 1896

Description: Cephalothorax broad, black with dense patches of greyish-white to silver hairs; abdomen large, oval-shaped, greyish in colour with brownish or dark grey marks at the apex of the abdomen; legs long, slender, black with dull yellow to gold bands at the distal ends of the major leg segments and with tufts of short black hairs. Males are much smaller than the females with short black legs, slender body, black cephalothorax and a small greyish-brown abdomen. Body length: 5-6 mm (males); 20-28 mm (females).

Life history and habits: Commonly known as the Ornate Golden Orb-weaving Spider. The mature female builds a very strong and permanent web amongst bushes and trees and

even amongst telephone wires. The web is vertical and is strengthened on either side by a large number of support threads. These support threads and the radial lines of the web are composed of grey silk but the spiral threads are golden, hence the common vernacular name. A distinctive feature of the web are the prey items wrapped in silk which are placed in several series along the support threads. The golden orb web is composed of series of four or five lines of golden silk forming a band, and each one is separated by a pair of thin, colourless lines. The upper part of the web lacks the spiral turn of golden silk. The small males are usually difficult to find and they rest on the outskirts of the web during the mating season. The female rests upside down at the centre of the web during the day. The golden silk of the orb is very strong and occasionally small birds and frogs, large beetles, cicadas and cockroaches and other insects become caught when they inadvertently contact the webs. Orb-weaving spiders usually construct their webs between trees and bushes growing along creeks and other coastal and inland freshwater systems. The mature female constructs an oval-shaped egg-sac measuring about 35-40 mm long and 25-30 mm wide at the widest point. It is composed of bright golden-yellow silk and is usually camouflaged amongst foliage, dead leaves or other debris usually near the outskirts of the web. Each egg-sac contains 300-500 non-glutinous, dark golden-coloured eggs with a frosty appearance, each measuring about 0.8-1.0 mm in diameter. They take several weeks to hatch and the young spiderlings remain with the sac and web until after the first moult after which they gradually disperse.

Habitat: Heathlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, NT.

Photograph: Brisbane, Q; female: 26 mm body length.

(Plate 112)

Nephila edulis Koch, 1871

Description: Cephalothorax brownish-black with a dense covering of silver-white hairs; abdomen large, densely covered in short, silvery-white hairs; legs pale brown with black bands of hairs; brown patches on legs with grey-white hairs. Males differ significantly from the females in having much smaller bodies which are mostly dark brown and black in colour, with short silvery hairs and a pale brown abdomen. Body length: 4-5 mm (males); 20-25 mm (females).

Life history and habits: Commonly known as the Golden Orb-weaving Spider. It is closely related to the previous species, *N. ornata*, but the females of *N. edulis* differ slightly in the shape of the cephalothorax and the legs are differently coloured with a denser covering of hairs. *N. ornata* usually builds its web high amongst trees etc.,

but *N. edulis* appears to prefer a low web near ground level. Its golden orb web is usually smaller than that of *N. ornata* and is usually built amongst low-growing shrubs and small trees in coastal areas. Like most *Nephila*, the females normally rest during the day and night; upon their webs they are usually very wary and react to the slightest vibrations on the web; if adversely disturbed, they scurry up and along their webs into foliage nearby. After mating, the female constructs a broadly oval, disc-shaped egg-sac measuring about 35-40 mm long by 25-30 mm wide at the widest point. The sac is composed of dark yellow to orange, loose but intricate woven silk. It is placed at the edge of the web amongst foliage or the spider may fasten leaves to the sac. Each sac contains 300-500 bright yellow, non-glutinous, globular eggs with a frosty appearance. The spiders feed on a variety of flying insects that become caught in the webs, e.g. bees, beetles, butterflies, bugs and flies.

Habitat: Heathlands, woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, NT, WA.

Photograph: Brisbane, Q; in a residential garden; female: 28 mm body length.

(Plate 113)

Phonognatha graeffei (Keyserling, 1865)

Description: Cephalothorax and legs pale orange-brown to pale reddish-brown, abdomen cream with distinctive dark brown and black triangular markings on the dorsal surface as well as a central longitudinal line and two large dark brown to rectangular marks on the abdomen behind the cephalothorax. Immature spiders are mostly pale yellow to pale buff brown in colour with pale markings on the dorsal surface of the abdomen. Males are similar in colour and pattern to the females but are slightly smaller. Body length: 5-6 mm (males); 8-10 mm (females).

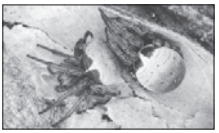
Life history and habits: Commonly known as the Leaf-curling Spider. This species is probably one of the best known and most widespread species of Australian spider. The spider selects a dead, dry leaf from the ground or one wedged amongst foliage nearby and hauls it onto the web by a silken thread. Usually a dead *Eucalyptus* leaf is used and is mostly placed in an upper portion of the web. Both males and females use a leaf as a retreat in their webs. The female uses another leaf as protection for the egg-sac, but instead of binding the edges of the leaf longitudinally, the leaf is folded in half and bound with silk along the sides. The egg-sac is placed in a partially folded leaf before the final seals are laid down. The egg-sac is suspended from nearby foliage or a small branch of a tree or shrub. The rounded, oval-shaped, flattened egg-sac, measuring 8-10 mm long by about 6-8 mm wide, is composed of loose, cream-coloured silk. The female builds only one egg-sac which contains 150-200, pale cream, globular eggs, each

measuring about 0.7-0.8 mm in diameter. The young spiderlings hatch from the eggs within about 2-3 weeks and remain near the egg-sac until the first moult after which they gradually disperse. Mature spiders feed on a wide variety of flying insects which become caught in their webs, such as moths, bees, small beetles, flies and mosquitoes. The leaf-curling spiders are very active once disturbed and if the curled leaf is unrolled for any length, the spider usually drops to the ground below and scurries for cover.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V, SA, T.

Photograph: Glenbrook, Blue Mountains, NSW; female: 9 mm body length.



(Plate 114)

Phonognatha melania (Koch, 1871)

Description: Cephalothorax and legs dark reddish-brown to dark brown; abdomen large in proportion to rest of body, pale greyish-brown at the anterior third and dark grey-brown for the remaining portion; two triangular, dark brown to almost black marks at the anterior margin of abdomen; dorsal surface of abdomen also with transverse series of tiny black points. Males are similar in colour pattern to the females but are much smaller. Body length: 5-6 mm (males); 8-10 mm (females).

Life history and habits: Commonly known as the Dark Leaf-curling Spider because of the dark coloration of the body and legs in comparison to the better-known species, *P. graeffei*. This species is often common in coastal districts where it may be sympatric with *P. graeffei*. The egg-sac and early life-stages have not been described but they are probably similar to those of *P. graeffei*. The mature spiders feed on a wide variety of insects that become caught in their often somewhat simple webs which only consist of a few traplines.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V, T.

Photograph: Coffs Harbour, NSW; females: 9 and 10 mm body length.

(Plate 115)

Poltys laciniosus (Keyserling, 1865)

Description: Body and legs generally dark grey in colour with black mottling and small black spots; femurs of the legs are marked in maroon, grey and black; these

colours are exposed only when the spider is walking; abdomen prominently arched higher than the rest of the body with at least two blunt tubercles at the apex. Males are similar to females but have a smaller abdomen. Body length: 4-5 mm (males); 9-10 mm (females).

Life history and habits: Little has been recorded on the biology and behaviour of these somewhat rare, cryptic and secretive spiders. The genus *Poltys* contains some of the most unusually shaped of Australian spiders. They construct very fine orb webs in the early hours of the night and destroy them just before dawn. During the daytime, the spiders rest motionless with their legs tightly folded over the cephalothorax and touching the abdomen, on a dead branch or twig of a tree where they are well camouflaged. The egg-sac and early life stages have not been described. The mature adults feed on a variety of small air-borne insects such as flies, moths and bugs.

Distribution: Q, NSW.

Habitat: Woodlands, dry sclerophyll forests.

Photograph: Brisbane, Q; collected from a branch of a *Eucalyptus* tree (Myrtaceae); female: 8 mm body length.

(Plate 116)

Poecilopachys bispinosa (Keyserling, 1865)

Description: Cephalothorax and legs dark orange-red (orange in mature specimens) to black; abdomen greatly enlarged, with two white and yellow tubercles on the dorsal surface towards the posterior margin; abdomen variable in colour and pattern with a broad white and bright yellow frontal margin, and reddish, grey, yellow and greenish-grey coloration around and in between the tubercles. The male is similar to the female in coloration and morphology but is markedly smaller. Body length: 2-2.5 mm (males); 6-7 mm (females).

Life history and habits: This variable species is commonly known as the Two-spined Spider because of the presence of the two, white spinose tubercles on the abdomen. This is a rather secretive species and during the day they are usually encountered resting with their legs retracted and hunched together and with the body flat against the surface of a leaf (often the underside of a leaf where they are well camouflaged). The female builds a small orb web, either situated between the branches of trees or nearer the ground amongst grass and other plants. A spindle-shaped egg-sac is constructed by the female and measures about 20-25 mm long, the outer covering of which is composed of brown, papery layers of silk and is encased with a loose tangle of web. The creamy-coloured eggs measure

0.7-0.8 mm in diameter and number from 45-70 eggs per sac. The mature spiders feed on small bugs, flies and other soft-bodied insects.

Habitat: Woodlands, heathlands, dry sclerophyll forests.

Distribution: Q, NSW.

Photograph: Brisbane, Q; female: 7 mm body length.

Family **Tetragnathidae**

(Australian species: about 20; World species: about 1000)

These spiders are commonly known as the Four-jawed or Long-jawed Spiders, because members of this group are easily recognized by the very long, dark-coloured chelicerae which prominently project from the front of the cephalothorax, and which together with the two long palps, give the appearance of the spiders having four "jaws". Despite their somewhat awesome appearance, these spiders are usually harmless to humans. In addition to the chelicerae and palps, these spiders are distinguished in having very long, cylindrical abdomens.

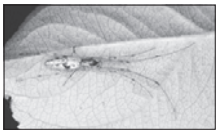
Most species are usually common during spring and summer, when they build horizontal or oblique orb webs amongst reed beds, long grass or other low vegetation, usually near water. Clusters of several webs are often stretched across narrow flowing creeks and rivulets and ponds, in order to capture small flying insects such as damselflies, caddis flies and moths which are attracted to the water. When not resting in the web, the Four-jawed Spider rests tightly against a grass leaf, a reed or twig with the first two pairs of legs stretched out in front and the other two pairs behind (the third pair is often used to grasp the substrate). Most spiders of this family are drab brown and grey in colour with tubercles and other adornments on the abdomen. Thus their colours, posture and immobility when resting on leaves and twigs, act as a splendid camouflage against potential predators which may be lurking nearby. The common habit of these spiders for frequenting grass has given rise to them being given another common vernacular name of Grass Spider for the group but Jawed Spider appears to be a more apt name and the latter is now more commonly used whenever the family is encountered.

The chelicerae of the male Long-jawed Spider possesses two long projections or teeth which lock onto the fangs of the female during mating and prevent the female from biting. The palps of the male are long and thin so that the male is able to reach the epigynum of the female for sperm deposition while holding the female steadily in position.

Most of the Australian members of the family have been placed in the genus *Tetragnatha* (Latin for "four-jawed"). One of the most common and distinctive species in eastern Australia is *Tetragnatha bituberculata* (Koch, 1867), which occurs in eastern

New South Wales and Queensland. It is usually a silvery-grey spider with black markings on the abdomen and legs; the legs are mostly yellowish-green and banded with black, while the abdomen has two prominent median tubercles on each side. The female builds 2-3 small, disc-shaped egg-sacs of dirty-white to greyish silk with small protuberances of silk scattered randomly over them; they measure 3.5-5 mm in diameter at the widest point and contain 25-30 whitish, non-glutinous eggs, each measuring about 1 mm in diameter.

The genus *Tetragnatha* is represented here by two species.



(Plate 117)

Tetragnatha demissa Koch, 1872

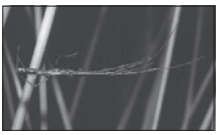
Description: Body cylindrical, pale grey; chelicerae and cephalothorax black and dark grey; abdomen with variable black marks on the sides and dorsal surface; legs buff with black marks. Males are similar to females but are smaller with a narrower, tapering abdomen. Body length: 10-12 mm (males); 12-14 mm (females).

Life history and habits: This is a common species in eastern Australia where it builds a delicate orb-web amongst grass or low vegetation, usually between 0.5-1.5 metres above ground level, often over small creeks or stagnant pools of water. They are usually very wary and if the web is disturbed, they quickly rush to a leaf or twig near the outskirts of the web where they will rest in a motionless state with the first two pairs of legs outstretched and the others behind; in this situation, they are often well camouflaged as they rest lengthwise parallel to the twig or leaf. If further disturbed, they usually drop to the ground or foliage near the ground where they remain motionless and are almost impossible to detect even at close range. The egg-sac is deposited at the outskirts of the web on a leaf or twig of a plant which is usually suspending the web, and measures about 5-6 mm in diameter. It is slightly flattened globular in shape, composed of strong off-white silk and covered in a few layers of fluffy white silk with patches of dirty-brown silk randomly distributed over the surfaces. The egg-sac contains 50-60 pale buff-brown, non-glutinous, almost spherical to nearly ellipsoid eggs, arranged in a dense, tight mass, and each measuring about about 0.5-0.6 mm in diameter. The male spider is eaten by the female after mating and as soon as the egg-sac is constructed. The spider feeds on small flying insects such as gnats, mosquitoes and other small flies and moths.

Habitat: Woodlands, dry sclerophyll forests, cleared paddocks, residential areas.

Distribution: Q, NSW, V.

Photograph: Nimbin, NSW; female: 13 mm body length.



(Plate 118)

Tetragnatha luteocincta Simon, 1908

Description: Body cylindrical; chelicerae black; cephalothorax and abdomen dark brown; legs blackish; dorsal surface of abdomen and parts of the sides with at least four, broad, blackish marks. Males are similar to the females in colour pattern but are smaller with a narrower, tapering abdomen. Body length: 10-11 mm (males); 12-14 m (females).

Life history and habits: Nothing previously has been published on the biology and habits of this species which appears to be restricted to southern coastal Western Australia. It builds a delicate orb-web amongst reeds of creeks usually within 1-1.5 metres above ground level. They, like most orb-weavers, are very wary and move quickly along a support thread to foliage nearby the web where they rest motionless against a stem of a reed or other foliage. The egg-sac and early life-stages of this species have not been described but these are probably similar to other *Tetragnatha* species. These spiders feed on a variety of small, soft-bodied insects such as mosquitoes, flies, small beetles and moths that become caught in the small orb-webs.

Habitat: Heathlands, woodlands, swamps.

Distribution: WA.

Photograph: Samson Brook, WA; in reeds at the edge of a creek; female: 14 m body length.

Family **Theridiidae**

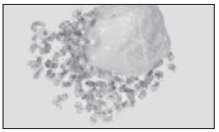
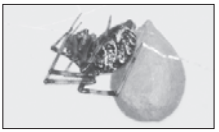
(Australian species: about 60; World species: about 2200)

This large, world-wide family consists mainly of delicate, small-bodied spiders with a prominently over-sized, globular (or nearly so) abdomen and relatively long, thin, spineless legs. They are mostly sedentary animals, living in untidy, irregular, tangled webs amongst foliage, under stones, bark and fallen logs, under houses and between walls, against fences and other man-made objects. The spiders hang upside-down in their messy webs which are never constructed in a sheet or as an orb-web like many other spiders. Some members of this family are commensal, which is to say, they do not construct their own web, but live in the webs of other unrelated spiders, where they share their host's food captures. A few species of Theridiidae may neither build a messy web nor use a web of another spider, but instead, they simply erect a non-elaborate trap-line to catch small insects and other spiders. The members of this family are commonly called Comb-footed Spiders because of their "comb", a

series of serrated spines along the outside margin of the tarsi of the last (fourth) pair of legs. This comb is used to comb out the silk from the spinnerets.

Comb-footed Spiders are well represented in Australia with about 18 genera, but most of the species are not well known even to specialists, and knowledge of their biology, habits and distribution are entirely lacking. The family includes the very well known, intensely studied, dangerous, Red-back Spider, *Lactrodectus hasselti* Thorell, 1870, which is described in some detail below. Other genera represented in Australia include *Argyrodes* (10 species), *Ariamnes* (two species), *Lactrodectus* (with two introduced species), *Nicodamus* (five species) and *Theridion* (36 species).

The genera represented in this book are *Achaearanea, Ariamnes, Argyrodes, Lactrodectus, Nicodamus, Theridion* and *Conopistha*.

(Plates 119 & 120)

Achaearanea tepidariorum (Koch, 1841)

Description: Abdomen and legs dirty-white, yellow-brown, buff-brown to brownish-black; cephalothorax yellow-brown with grey and brown marks on the dorsal surface and sides; abdomen with at least six transverse brownish-black marks curving upwards and partly connected by black spots near the margins; the abdominal markings are variable and in most light-coloured specimens, all of these markings are smaller and less defined. Males are usually darker orange-brown in colour with the first two pairs of legs longer. Body length: 7-8 mm (males); 9-12 mm (females).

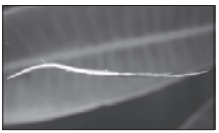
Life history and habits: Commonly known as the House Spider because it is often common around unoccupied houses and sheds. Webs are also placed amongst rocks and rarely amongst foliage. In residential areas, large, irregular, tangled webs are usually constructed in the corners of rooms or sheds, under furniture and old boxes, in angles of fences and under the awnings of houses. The spider usually rests upside down in a sheltered part of the web where it is more closely woven but is not dense enough to conceal the spider. Occasionally, a mature spider may construct a web in an open, unsheltered situation. In this instance, the spider will often carry a piece of leaf or some other debris into the web which will act as a retreat for the spider. The webs of young spiders are usually more regular in construction than those of the mature spiders. A male and a female may occupy the same web for a considerable amount of time before mating occurs. After mating, the female constructs a number of pale brown, papery egg-sacs which are pear-shaped. Up to about 8 egg-sacs per female per season are produced and each measures about 7-10 mm long and 6-9 mm wide. Mature spiders feed on a wide variety of insects, such as grass-hoppers, flies, beetles, moths, bees and many other insects flying around

houses or attracted to lights at night. The chromosomes of this species have been examined recently in the laboratory and it was found that at the first meiotic division, there were 10 autosomal bivalent chromosomes and two univalent sex chromosomes present in the cells studied.

Habitat: Residential areas.

Distribution: WA, SA, T, NSW, Q, V, NT, Europe, North America, Asia.

Photographs: Brisbane, Q; young spiderlings (Plate 119) hatching from egg-sac; female (Plate 120) on egg-sac; female: 10 mm body length.



(Plate 121)

Ariamnes colubrinus Keyserling, 1890

Description: Cephalothorax, abdomen and legs dark brown, cephalothorax small in relation to the very long, narrow, cylindrical abdomen which tapers near the apex. Immature specimens are usually green, yellow-brown, pale brown or reddish-brown. Males are similar to females in colour pattern but they are smaller with slightly narrow abdomens. Body length: 12-15 mm (males); 20-25 mm (females).

Life history and habits: Commonly known as the Whip or Stick Spider because of the form of its very narrow body and the long, dark-coloured abdomen. These spiders are often common in eastern Australia, both in native habitats and in residential gardens. Because of their narrow bodies and cryptic coloration, they are seldom seen by the casual observer or naturalist and are difficult to detect, especially if they are resting amongst dead grass stalks and sticks. During the day the spider rests motionless in a longitudinal position with the legs outstretched and held parallel to the body so that they resemble a splinter of wood, piece of bark or other debris, which has been caught amongst the few strands of spider web. During the night, *Ariamnes* adults abandon their daytime protective posture and hang downwards towards the ground, where their legs are attached to a few long strands of silk acting as a snare and which are connected at their other ends to the ground or foliage below. In some cases, these snares or traplines may consist of only a very thin, single thread. *Ariamnes* makes no other web or snare as do other members of its family, but relies on this crude snare to capture prey. Despite this simple, primitive snare, *Ariamnes* collects tiny nocturnal insects which accidentally hits the thread(s). When an insect is captured, the spider moves rapidly along its trapline and quickly and efficiently wraps the prey with a secure layer of silk. The mature spiders feed on small insects and spiders. One published report noted that the spiders' prey consisted entirely of male spiders which had crawled up the traplines during their nocturnal movements. The female constructs an ovoid, whitish egg-sac

of strong, papery silk (which with age becomes discoloured and mottled with green to brown coloration) and is truncate at the distal end, rounded and tapered at the other end and measures 4-5 mm long and 3-4 mm in diameter. It is connected at the rounded end to a portion of the snare or to a building, leaf or twig, by a long, thick, stiff silken thread measuring about 25-35 mm long. It is anchored firmly and is able to withstand winds and other adverse environmental conditions. Each egg-sac contains 40-50 pale yellow-green, non-glutinous eggs, each measuring about 0.6-0.7 mm in diameter, wrapped in fine soft silk. The female guards the egg-sac until the young spiderlings hatch within two weeks.

Habitat: Woodlands, dry sclerophyll forests, residential areas adjoining these habitats.

Distribution: NSW, Q.

Photograph: Brisbane, Q; female: 22 mm body length.

(Plate 122)

Argyrodes antipodianus O. Pickard-Cambridge, 1880

Description: Cephalothorax and legs black; abdomen very large in proportion to the rest of the body, triangular-shaped, silver for most of its surface, black on the ventral surface. Males are similar in colour pattern to the females but are slightly smaller and have slimmer and much flatter abdomens. Body length: 2-2.5 mm (males); 3-4 mm (females).

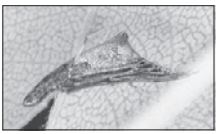
Life history and habit: Commonly known as the Quicksilver or Dewdrop Spider because of its bright silver coloration on the abdomen. If disturbed, these spiders usually move for some distance along a thread before dropping to the ground below. If a hand is placed under them before they fall, they quickly gyrate their bodies upon contact in such a manner that they resemble the behaviour of mercury (viz. quicksilver) rolling about in the hand, hence the name of Quicksilver Spider. These tiny spiders are remarkable members of the family in that they do not spin their own webs but instead live in the webs of larger spiders where they share the prey which is captured within their host's snare. *A. antipodianus* is mostly found in the large webs of the family Araneidae such as *Cyrtophora moluccensis* and *C. hirta* (Tent Spiders), *Nephila edulis, N. ornata* (Orb Weavers), *Eriophora* spp. and occasionally *Argiope* species. They usually rest on the outskirts of their host webs but they do not appear to be disturbed by their hosts and often feed on prey close by to the host. Up to 25 Quicksilver spiders may be present in any one web. The females construct a globular-shaped egg-sac measuring about 3-4 mm in diameter of strong, papery brown silk; at the distal end there is a short funnel, and at the other end, there is a long, thick silken thread which is attached to a part of the host web (usually on the

outskirts) or to a leaf or twig outside, but close to the host web. Each egg-sac contains about 20-35, non-glutinous, almost spherical, white eggs, each measuring about 0.3 mm in diameter. Mature spiders feed on a variety of a small insects that become caught on the web of their host spider.

Habitat: Heathlands, woodlands, dry sclerophyll forests, rainforests, residential areas.

Distribution: Q, NSW, Lord Howe Island, New Zealand.

Photograph: Brisbane, Q; female: 3.5 mm body length.



(Plate 123)

Argyrodes sp.

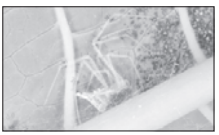
Description: Cephalothorax dark chocolate-brown; abdomen very large and extended, pinkish-brown, mottled with various shades of pink, cream and brown in the anterior half nearest the cephalothorax; legs dark brown to lighter brown. Males are similar in colour pattern to the females but have much smaller abdomens. Body length: 5-6 mm (males); 7-8 mm (females).

Life history and habits: Nothing previously has been recorded on the biology and behaviour of this rare but very distinctive species. The spider usually frequents shady creek banks where it rests or hunts during the day amongst foliage. The web, egg-sacs and early life-stages are unknown. When disturbed, the spider retracts its legs closely to the abdomen and instead of a spider, it resembles a small piece of bark or other debris; this is an interesting mechanism for avoiding predation.

Habitat: Dry sclerophyll forest.

Distribution: Q.

Photograph: Brisbane, Q; female: 8 mm body length.



(Plate 124)

Conopistha sp.

Description: Body and legs cream to pale creamy-buff; legs with prominent clusters of thick black hairs and a few single scattered black hairs; abdomen prominently latero-dorsally flattened. Males are similar in colour and pattern but have smaller abdomens. Body length: 3-4 mm (males); 5-6 mm (females).

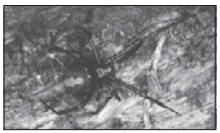
Life history and habits: Nothing previously appears to have been written on the biology of this species. It is a secretive, nocturnal spider which rests during the day under the

leaves of various broad-leaved plants in shady situations. The female usually rests in a retreat of very fine thin silk. When disturbed, these spiders hold the legs close to their bodies so that they appear as small as possible and resemble small pieces of debris etc. The egg-sacs and early life-stages have not been described.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q.

Photograph: Brisbane, Q; under the leaf of a papaw plant, *Carica papaya* (Caricaceae); female: 5 mm body length.



(Plate 125)

Lactrodectus hasselti Thorell, 1870

Description: Male: Creamy-brown in colour, abdomen with streaks of brown; dorsally with a pale red stripe and ventrally with a white hour-glass pattern formed by two black bars on each of the lateral margins; carapace about 1.0 mm long; abdomen about 1.7 mm long; due to the small size of the male, they are rarely observed; small spiders which often seen with the mature females are usually immature females. Female: Glossy black body and legs; abdomen with a broad, dorsal dark orange-red to scarlet red median stripe or large blotches (spots) and a distinctive median, white, red or orange to orange-red ventral hour-glass shape (or two spots); some females may be lighter dark brown but these colour variations are rare; legs long, thin, up to 20 mm long, tapering at the ends; abdomen globular, up to 10 mm long. Early instars cream with six black dorsal spots on the abdomen. Later instars cream in colour with dark brown to black stripes and an indistinct dorsal orange to red stripe and the typical hour-glass pattern on the ventral side of the abdomen. The black colour of the mature female is not attained until the final moult.

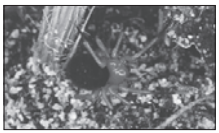
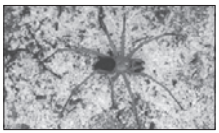
Life-history and habits: Commonly known as the Red-back Spider (less commonly as the Jockey Spider); this is probably the best-known and studied spider in Australia because of its widespread distribution and very toxic properties. The species occurs throughout mainland Australia and Tasmania, both in native habitats and in residential areas; they are particularly abundant in disturbed habitats. It is believed (at least in the past) by a number of authorities that the Red-back Spider is not native to Australia and that it is a subspecies (or geographical variant) of the American Black Widow Spider and the New Zealand Katipo (or Night Stinger) (*Lactrodectus mactans*). However, other authorities consider the spider to be native to Australia and to be a separate species altogether (*L. hasselti*). The present consensus is that the species should be regarded as an Australian endemic, *L. hasselti*. It is interesting to note that the spider was not recorded from Australia until 1870 (from

the Rockhampton district of coastal northern Queensland), where it is believed to have been introduced by overseas ships (although no documentary evidence exists). Whatever its origins, many believe that the Red-back Spider is the deadliest spider in Australia. Records indicate that up until the 1950's, there had been numerous reports of people being bitten by the creature with at least 13 deaths! One authority suggested that there were probably many more deaths than officially recognized because spiders purported to have bitten people were not collected for later identification and so doubt remains as to the agent of death. The specific antivenene (antivenom) was not developed until 1956 [from the Commonwealth Serum Laboratories (CSL), Parkville, Victoria]. This antivenene has undoubtedly saved many lives because since that time the incidence of Red-back Spider bite has increased dramatically. Since 1960 there have been well over 5000 recorded cases of Red-back Spider bites, indicating a great upsurge in human contact with the spider. This has probably been due to the relatively recent increase in distribution and population numbers of the spider in urban/residential areas accompanied with the growth of cities and towns in eastern and southern Australia during the past 30 years. The female Red-back is indeed the "deadliest of the species" (as the old saying goes); the male is too small to bite or to inflict any injury. The female usually constructs a most complicated web. At the base of the web there is a sticky trap consisting of a number of strong, tight, viscid threads extending downwards from a messy tangle of silk. These sticky threads are attached to the ground and when an unsuspecting ground-moving insect or other soft-bodied invertebrate touches a thread, it breaks the thread's contact with the ground and the insect is drawn into the silken mass where it is killed by the spider and enveloped in more silk. This messy snare is connected to a tube composed of very strong, yellowish silk which acts as a retreat funnel where the spider rests during the day and from which it emerges during the night to remain near the snare. Around the funnel is usually an irregular network of silken threads. The webs of immature females usually lack the well-constructed retreat, and webs in confined spaces may only consist of the tangled snare and the viscid threads. Red-back Spiders commonly live in boxes, in old rusted tins and in old drums of all kinds, amongst farm machinery, in outdoor toilets, sheds and other buildings, amongst rubbish and other litter, and under houses, grates and awnings, and sometimes amongst garden rocks and shrubbery. In the natural bushland, they occur amongst stones, in hollow logs and stumps, and under loose bark. Food consists of a diverse range of insects, and occasionally small lizards and mice. The female red-back Spider lays from 50-200 eggs at a time, usually in four or five egg-sacs, which are spherical in shape, up to 10 mm in diameter, and yellow-brown in colour. One spider may lay eggs several times during its life-time and each batch is laid every one to three weeks. Females mature over a period of 4-8 months but about 5-6 months is average. The smaller males mature in less time, on average only about 2-3 months. Females are known to live up to two or

three years but the males only live for about six months. The new spiderlings emerge from their sacs after about 14 days of the eggs being laid; this hatching is usually correlated with the onset of rain when the temperatures are low and the humidity is high. The spiderlings usually disperse within a short period of time, but if the environmental conditions are adverse, e.g. if there is a lack of food and dry, hot conditions prevail, the young may remain sheltered in the web with the female. In this situation, the spiderlings usually become cannibalistic, and after some time, only one male may remain. He reaches maturity and even may mate with the female (i.e. his mother!), so that more eggs can be fertilized and laid when conditions have improved. When the young spiderlings are ready to disperse, they leave the web by a process known as "ballooning". This method involves each spider holding its abdomen upwards; a large droplet of silk is produced on the spinnerets and a breeze or gust of wind draws the liquid silk out into a long thread that eventually produces enough lift to carry the small spider away from the parental web. The silken thread eventually adheres to an object from where the spider's new home is established. The effects of a Red-back Spider bite differ with the amount of venom injected and the state of the immune system of the person bitten. Symptoms have included muscular weakness, paralysis, nausea, vomiting, convulsions, diarrhoea, rashes, and in extreme cases, death. However, death from a bite nowadays is very rare, due to the availability of a effective antivenom (antivenene).

Distribution: NSW, V, SA, Q, NT, WA, SA, T, Arabia, South-east Asia, Pacific Islands. [One authority stated that the spread of the spider in the Pacific region was assisted by Polynesian voyagers who carried the spider undetected in their canoes!].

Photograph: Toowoomba, Q; underneath a log in a paddock; female: 23 mm body length.



(Plates 126 & 127)

Nicodamus bicolor (Koch, 1872)

Description: Legs, cephalothorax and palps deep scarlet red, abdomen dull purplish-black to black with short black hairs. Males are similar to the females in colour pattern but have a slightly smaller body, longer legs and narrower abdomen. Body length: 8-12 mm (males); 10-14 (females).

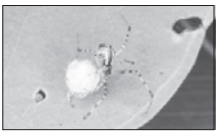
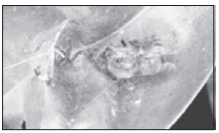
Life history and habits: Commonly known as the Red and Black Spider because of its colour pattern. They live usually close to or on the ground, under loose and fallen bark, under stones, logs and other debris. The female constructs a few irregular and tangled threads forming a "sheet" measuring 15-20 cm in diameter, under or amongst stones, hollow logs etc. It is built horizontally and the spider moves along the threads upside down. The more active males have the unusual habit of waving their front legs up and

down and tapping the ground with their palps as they walk along. The egg-sac is flat, composed of white, fluffy silk, usually situated in a secluded situation under bark or stones. There are 35-50 pale cream-coloured eggs, each measuring about 1 mm in diameter in each egg-sac. They feed on a variety of small insects.

Habitat: Heathlands, woodlands, dry sclerophyll forests.

Distribution: Q, NSW, V, SA, WA.

Photograph: Perth, WA; female (Plate 126): body length 12 mm;
male (Plate 127): body length 10 mm.



(Plates 128 & 129)

Theridion pyramidale (Koch, 1867)

Description: Cephalothorax pale greenish-buff brown with black marks dorsally and on the sides; abdomen narrowly triangular in shape and rising to a point, variously patterned in white, black, orange and orange-red stripes; legs pale yellow-buff brown with blackish bands of various lengths; the abdominal pattern is somewhat variable with brighter red/orange coloration and apparent melanic forms are also known. The males are similar in colour pattern to the females but have smaller abdomens. Body length: 2-3 mm (males); 4-5 mm (females).

Life history and habits: Commonly known as the Pyramid Spider because of its pyramid-shaped abdomen. These spiders build irregular tangles of silk as a snare, usually amongst foliage of living trees and bushes. Some of the strands of silk which hang vertically downwards from the tangled mass of silken fibres may have a sticky drop of fluid at the ends. When a small insect brushes onto the viscid droplet, the strand rapidly curls upwards entangling the prey with the droplet and silk. During summer, the female constructs a small, spherical, whitish to pale grey-brown egg-sac measuring about 2.5-3.5 mm in diameter; it is suspended amongst the silken strands of the web-snare, fastened to the edge of a leaf or placed amongst dead twigs and leaves near the snare. The egg-sac contains 40-50 small, pale-cream coloured, non-glutinous eggs, each measuring about 0.2-0.3 mm in diameter. The eggs take 2-3 weeks to hatch and the young spiderlings stay with the sac, female and snare until after the first moult after which they gradually disperse. The mature spiders feed on a wide variety of small, flying insects such as moths, flies, mosquitoes and bees as well as ants.

Habitat: Heathlands, woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V.

Photographs: Toowoomba, Q: female (Plate 128): body length 4-5 mm;
Sydney, NSW; female (Plate 129): body length 4-5 mm.

(Plate 130)

Theridion extrilidum Keyserling, 1890

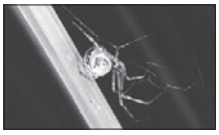
Description: Body and legs mostly pale buff brown to darker brown; carapace blackish-brown; abdomen large in proportion to the rest of the body, with a large black median mark which is bordered with white to cream; sides of abdomen blotched with white, cream and dark buff-brown; legs with dark brown bands; underside of body black and brown. Males are similar to the females in colour pattern but are slightly smaller. Body length: 2.5-3 mm (males); 4-5 mm (females).

Life history and habits: Despite being quite common throughout southern Australia, very little has been recorded on the biology of this spider which does not have a common name. It is usually found under or amongst the bark of trees or in curled, dead leaves hanging from trees or buildings. Part of the leaf is sealed at the edges with strong silk forming an enclosed retreat for the spider. The female constructs one or two egg-sacs, each measuring about 2.5-3 mm in diameter of greyish to pale purplish-grey silk. The egg-sac is spherical in shape and suspended in the retreat or attached to the surface of the leaf or bark by silken threads. The egg-sac contains 40-50 small, pale cream-coloured, non-glutinous eggs, each measuring about 0.2-0.3 mm in diameter. The eggs take 2-3 weeks to hatch depending on environmental conditions and the young spiderlings stay with the sac and female spider until the first moult. Mature spiders feed on a wide variety of small insects.

Habitat: Woodlands, dry sclerophyll forests, residential areas.

Distribution: Q, NSW, V, SA, WA, T, Norfolk Island.

Photograph: Toowoomba, Q; in a curled, dead *Eucalyptus* leaf; female: 4 mm body length.



(Plate 131)

Theridion mortuale Simon, 1908

Description: Cephalothorax reddish-brown in the centre and dark brown on the margins; abdomen globose with two broad reddish-brown to pinkish-brown stripes at the apex and white, brown and yellow marks on the dorsal surface and on the sides; legs buff-brown with darker brown bands. Males are similar in colour pattern to the females but are slightly smaller. Body length: 3-4 mm (males); 5-6 mm (females).

Life history and habits: Nothing has been published previously regarding the biology and behaviour of this small, attractive species which appears to be restricted to coastal

south-western Australia. The spiders construct a snare from a few silken threads amongst grass or other low vegetation. The egg-sacs and early life-stages have not been described but are probably similar to other *Theridion* species. Mature spiders feed on a variety of small insects such as flies and mosquitoes.

Habitat: Woodlands, dry sclerophyll forests, heathlands.

Distribution: WA.

Photograph: Perth, WA; female: 5.5 mm body length.

(Plate 132)

Theridion sp.

Description: Body and legs mostly dark reddish-brown; abdomen very large in proportion to the rest of the body, dark brown with reddish-brown portion on lower half, intersected with fine, white to cream lines at the posterior end of the abdomen. Males are similar in colour pattern to the females but are much smaller with less rounded abdomens. Body length: 4-5 mm (males); 7-09 mm (females).

Life history and habits: Little has been recorded on the biology and habits of this distinctive spider which may be mistaken for the deadly Red-back Spider, *Lactrodectus hasselti* (Thorell, 1870). However, this species us much smaller, is reddish-brown in colour, is not as black as in the Red-back and the abdominal markings are different; in this species, the reddish stripe and triangular pattern on the dorsal and ventral abdominal surfaces, respectively, are absent. This *Theridion* species constructs an untidy snare of several trap-lines between two trees or branches of trees, mostly 1-2 metres above ground level. The female rests within a dead, curled, *Eucalyptus* leaf or amongst other debris on the web-snare. One or two, almost spherical, pale purplish to pale buff-brown egg-sacs are constructed by the female; they are composed of dry, papery-like silk. Each egg-sac contains 80—100, non-glutinous, spherical, pale cream-coloured eggs, each measuring about 0.5-0.6 mm in diameter. The spiderlings hatch within about two weeks after the eggs have been laid and remain for some time in the leaf retreat with the female before gradually dispersing. The mature spider feeds on a wide variety of insects such as flies, bees, small beetles and mosquitoes.

Habitat: Heathlands, dry sclerophyll forests, woodlands.

Distribution: Q, NSW.

Photograph: Coffs Harbour, NSW; female: 8 mm body length.

Family **Barychelidae**

(Australian species: about 110; World species: about 300)

This is mostly a tropical and subtropical family of mygalomorph spiders which are widely distributed throughout Australia, Papua New Guinea, South America, Africa and India. Most of the Australian species are poorly known and there are a number of undescribed species, which indicates the lack of study of these interesting spiders. Barychelids are mostly medium-sized spiders, which are densely hairy and the legs have a large number of strong tufts of bristles on the tarsal claws which enable them to move vertically on smooth surfaces such as glass and plastic. They are sometimes found in houses but they mostly live in short burrows in sandy soils in their natural habitats. Their burrows usually have one or two doors of silk covering the entrance so that they may be commonly called Trap-door Spiders.

About 110 species in 12 genera are presently recognized from Australia and there are some other undescribed ones. The largest and best known genus in Australia is *Idiommata* which has at least four described species from Australia and one or two undescribed species. Other members of this genus are known from Papua New Guinea and Malaysia. The best known species of *Idiommata* is *L. blackwalli* (O. Pickard-Cambridge, 1870) which is a large, variable, black, dark grey or dark brown spider with a total body length of about 25-30 mm. It is restricted in distribution to coastal south-west Western Australia to the Flinders and Mt. Lofty Ranges in South Australia and is also known from several offshore islands. This species is often common in a number of Perth suburbs where individuals may be found under loose leaf litter. The spiders frequent coastal dunes, heathlands and open woodlands and mallee forests usually in semi-arid regions. *Idiommata blackwalli* digs a burrow measuring up to about 20 cm deep which is lined with a thick layer of silk. A disc-shaped plug of thick, strong silk is constructed by the spider and is fitted tightly into the entrance or entrances of the burrow. The egg-sac is almost spherical in shape and is held by the female or is placed at the base of the chamber and is not suspended by silk from the walls of the burrow like those egg-sacs of many other mygalomorph spiders. A related species, *I. scintillans* (Rainbow and Pulleine, 1918), is restricted to southern South Australia where it frequents open woodlands. Two other species, *I. fusca* Koch, 1874 and *I. iridescens* (Rainbow and Pulleine, 1918) are known from central coastal Queensland but nothing is known of their biologies and exact distributions. There have a few bites to humans recorded for *I. blackwalli* but these did not result in any deaths. It is most likely that all *Idiommata* species are dangerous to humans and should thus be treated with the utmost caution if encountered.

Synothele is a genus of 24 endemic species which occur mostly throughout Western Australia. At least one species is restricted in distribution to the Perth area (*S. michaelsoni* Simon,

1908) and two small islands off the south Western Australian coast [*S. parifusca* (Main, 1954)] respectively. Nothing has been recorded on their biologies and life histories.

One species from the genus *Idiommata* is represented in this book.

(Plate 133)

Idiommata sp.

Description: Dorsal surface of the cephalothorax and body greyish with dark brown, grey and lighter coloured hairs; palps and legs blackish-brown to sooty-black; underside of body sooty-black, book-lungs orange, base of chelicerae red. Body length: 15 mm (males); females (unknown).

Life history and habits: This is an undescribed species from south-west Western Australia. Like the males of most barychelid spiders, the specimen shown here was found wandering in search of a female or food, and in doing so, entered a house, probably attracted there by insects. The biology of this species is unknown but is probably similar to that of the closely related *I. blacknalli*. *Idiommata* spiders have a stridulatory organ composed of a series of short spines on the maxillae and longer bristles on the chelicerae which are rubbed together to produce sound in order to attract another spider of the same species for mating purposes. *Idiommata* feed on ants and other ground-dwelling insects.

Habitat: Woodlands, heathlands.

Distribution: WA.

Photograph: Jerramungup, WA; male: 15 mm body length.

Family **Theraphosidae**

(Australian species: about 9; World species: about 860)

This is a small family of usually very large, hairy spiders, which in Australia, occurs mainly in northern and south-western Australia. They are commonly called Bird-eating Spiders because they have been known to kill and eat small birds such as chickens. Other small vertebrates such as lizards and frogs are also preyed upon. They are very distinctive spiders; large (up to 6 or 7 cm body length) and covered with dense grey-brown to dark brown hairs all over their bodies and legs. Their legs are also clothed with spines and each leg has two claws with dense tufts of hairs. In some areas, certain theraphosid spiders are sometimes called Barking Spiders (see also *Selenocosmia* below) because of the noise produced from a stridulation organ consisting of a cluster of flattened spines on the ventral surface of the basal joint of the maxillae and a series

of bristles in the ventral surface of the chelicerae. When rubbed together, these produce a faint whistling sound. The spiders really do not produce a barking sound and hence the common name is rather a misnomer. The whistling sound is only produced as a warning sound when the spider is provoked or disturbed. The eyes are arranged in a compact group of two rows situated on a tubercle. Bird-eating spiders do not construct a web but instead, they live in deep, sinuous burrows that may measure over half a metre deep. Unlike other spiders which live in holes in the ground (e.g. trap-door spiders), they do not construct a lid of silk at the entrance of their burrows. Their burrows may be concealed under rocks, and beneath roots of trees and fallen logs, and may also have a sheet-web surrounding the entrance. The abdomen of theraphosid spiders possesses four spinnerets, the last segment of the lateral pair is long and tapered and sometimes turned upwards. There are four genera represented in Australia, but little is known about the ecology and distribution of the various taxa belonging to them. *Selenocosmia,* with about 5 or 6 species and *Selenotypus* with one species only, are the best known members of the family in Australia. *Selenocosmia* are large spiders with dense, long hairs on the legs and tarsi and have stridulatory organs on the chelicerae. These consist of a cluster of short, hard spines on the anterior margins of the maxillae and a series of short hairs on the outer portion of the chelicerae. They are rapidly rubbed together to produce sound. *Selenotypus plumipes* Pocock, 1895, is a very large, hairy, brown spider from northern Queensland which is distinguished from *Selenocosmia* by having the last pair of legs stouter and hairier than the first pair. This appears to be Australia's largest spider with a body length of about 60 mm and a leg span of up to 15 or 16 cm. The stout, strong fangs of the adult female measure up to 9 mm long. Their food consists of large insects as well as frogs and small reptiles. *Selenotholus foelschei* Hogg, 1902, is similar to the other species mentioned above but appears to be restricted to the Northern Territory. The burrow is typical of the group, being sinuous and long, up to 120 cm deep and has no lid. The species has also been reported feeding on small frogs and large insects. The genus *Selenocosmia* is represented here by the widespread species from Western Australia and the arid areas of South Australia and New South Wales, *S. stirlingi* Hogg and the related *S. crassipes* (Koch, 1874).

(Plate 160)

Selenocosmia crassipes (Koch, 1874)

Description: Cephalothorax, abdomen and legs stout, grey-brown to brown; body length up to 60 mm; males differ from the females by having a slightly narrower abdomen and shorter body.

Life history and habits: Commonly called the Bird-eating Spider or Tarantula. This spider is confined to the wet northern areas of Queensland and the Northern Territory as well as New Guinea. These spiders are nocturnal in habits and during the day they hide in a deep, sinuous burrow which measures up to 60 cm deep; a silk sheet is constructed around the entrance to capture inspects and ground-dwelling vertebrates. This species has been reported to feed on small chickens and frogs apart from insects and other invertebrates. In captivity, one large female *S. crassipes* killed and fed upon a half-grown tree frog (*Litoria caerulea*, Hylidae) over a six-hour period. These spiders apparently have very effective digestive fluids because all that remained of the tree frog after the six hours was a small ball of debris containing bones and skin in an unrecognizable state. Since the fangs of *Selenocosmia* may measure up to about 9 mm long, they can inflict a deep and very painful wound and so the spider should be treated with extreme caution. Mating in this species occurs during late September to the end of October and females produce egg-sacs by November to December. The female Bird-eating Spider lays 45-50 yellow, translucent, non-glutinous eggs, each of which measure about 2.5 mm in diameter. They are laid in an oval-shaped, white egg-sac composed of very strong silk; the sac measures about 35 mm long and up to 30 mm wide. The young remain with the mother after hatching and measure about 10 mm body length at the time of leaving the burrow.

Habitat: Wet sclerophyll forests, rainforests, dry sclerophyll forests, woodlands.

Distribution: Q,NT, Papua New Guinea.

(Plate 134)

Selenocosmia stirlingi Hogg, 1901

Description: Cephalothorax, abdomen and legs stout, grey-brown to brown, with dark brown margins to the cephalothorax, dark brown markings on the upper half of the abdomen and on the femurs of all pairs of legs; last pair of legs slightly longer than the first pair; body length up to 55 mm; males differ from the females by having a slightly narrower abdomen and shorter body.

Life history and habits: Commonly called the Bird-eating Spider or Tarantula. This spider is confined to the southern, dry inland areas of Western and South Australia. These spiders are nocturnal in habits and during the day they hide in a deep, sinuous burrow which measures up to 60 cm deep; a silk sheet is constructed around the entrance to capture inspects and ground-dwelling vertebrates. Since the fangs of *Selenocosmia* may measure up to about 9 mm long, they can inflict a deep and very painful wound and so the spider should be treated with extreme caution. The female Bird-eating Spider lays 45-50 yellow, translucent eggs, each of which measure about 2 mm in diameter.

They are laid in an oval-shaped, white egg-sac composed of very strong silk; the sac measures about 35 mm long and up to 30 mm wide.

Habitat: Deserts, semi-deserts.

Distribution: WA, SA, NSW.

Photograph: White Cliffs Homestead, east of Laverton, WA; female: 52 mm long.

Family **Actinopodidae**

(Australian species: 10; World species: about 40)

This is a small family of mostly tropical and subtropical spiders occurring in Australia, Papua New Guinea and South and Central America. There is presently only one genus recorded from Australia, namely *Missulena*, which occurs throughout the continent, except for Tasmania, where they are yet to be discovered. It is very interesting that one species, *Missulena tussulena* Goloboff, 1994 has been recently described from Chile, indicating a Gondwanic distribution for the genus. *Missulena* spiders occur mainly in dry areas in the tropics and the subtropics and are generally absent from the wetter habitats such as rainforests. The mature spiders of this genus are usually black in colour, with short legs, broad, bulbous cephalothorax and short, rounded, hairy abdomens which give them a somewhat stumpy appearance. The large jaws are each furnished with a toothed digging rake. Although widely distributed, especially in the more inland, drier areas, they are uncommon and are rarely observed in the field by the casual observer. *Missulena* are true trap-door spiders and they have a burrow which is unique in having two doors instead of the usual one. These doors are hinged at about 120 degrees to each other and are thin and flap-like or heavy and plug-like. In addition to the primary doors, there is often a side passage which may be also provided with a door. This passage provides a hidden retreat for the spider when predators such as centipedes enter the burrow. Since *Missulena* spiders tend to be broad and stumpy, their burrows tend to be oval in cross-section, with enlarged areas which permit the spiders to turn around freely without being wedged in their chambers. Ground invertebrates, especially ants and beetles, are their main food.

The genus *Missulena* is represented here by three species.

(Plate 135)

Missulena bradleyi Rainbow, 1914

Description: Cephalothorax, chelicerae and legs, glossy-black, abdomen dark grey to greyish-brown. Males differ from the females in having a white spot on the base of

the abdomen and a generally lighter coloured and smaller abdomen. Body length: 14-16 mm (males); 16-22 mm (females).

Life history and habits: This species displays a typical life history and behaviour as for the genus as a whole. The females dig a vertical burrow which is lined with thick silk. The burrow has two entrances, each with a trap-door. The burrow also possesses a perpendicular side-shaft which is closed by a vertically hinged door and functions as a brood chamber. The spiders feed on a variety of ground-dwelling insects such as beetles and ants as well as native snails which are caught within easy reach of the burrow entrance. This species, like most mygalomorphs should be treated with the utmost caution if encountered. There have been a number of reports of bites from this species, e.g. during February 1985, a 19-month old girl from Gatton, west of Brisbane, south-eastern Queensland, was found playing with a large specimen of *M. bradleyi* on the kitchen floor of the family home. The child began vomiting and was unconscious within 30 minutes. As a last resort, Dr Struan Sutherland, the Australian authority on spider venoms was contacted and he suggested that the doctors administer funnelweb (*Atrax*) antivenom. The infant improved rapidly, but did not recover consciousness for 12 hours.

Habitat: Woodlands, sandplains, dry habitats.

Distribution: Q, NSW, NT.

Photograph: Gympie, Q; male: 15 mm body length.

(Plate 136)

Missulena granulosa O. Pickard-Cambridge, 1869

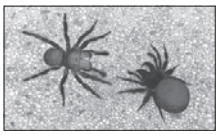
Description: Body and chelicerae dark brown to black, with bases of chelicerae and front of caput often dark reddish-brown. The males differ from the females in having the whole of the chelicerae and cephalothorax bright red and in having a purplish-blue abdomen. The male is also more slender. Body length: 12-15 mm (males); 20-24 mm (females).

Life history and habits: Males are often found crawling over the ground during daylight hours. The burrow of this species is similar to that described for *Missulena bradleyi* Rainbow, 1914 and measures up to 30 cm deep. The spiders feed on insects (especially ants) and native snails.

Habitat: Open forest, woodlands, arid areas with some plant cover.

Distribution: WA.

Photograph: Near Geraldton, WA; female: 20 mm body length.



(Plate 161)

Missulena insigne (O. Pickard-Cambridge, 1877)

Description: Cephalothorax black, abdomen brownish, legs black. The males differ from the females in having the whole of the chelicerae and caput bright red to orange-brown and in having a purplish-blue abdomen. The male is also more slender. Body length: 12-14 mm (males); 16-20 mm (females).

Life history and habits: Males are often found crawling over the ground during daylight hours. The burrow of this species is similar to that described for *Missulena bradleyi* Rainbow, 1914 and measures up to 30 cm deep. The spiders feed on insects (especially ants) and native snails.

Habitat: Open forest, woodlands, arid areas with some plant cover.

Distribution: Q, NSW, V, NT, Papua New Guinea.

Family **Dipluridae**

(Australian species: about 100; World species: 175)

The Dipluridae are one of the better known families of mygalomorph spider, found in tropical to sub-temperate regions on all continents, and are well represented in Australia with at least 17 genera and over 90 species. However, most of our species are uncommon and live in remote areas and are rarely encountered by the general public. They are mostly large, hairy, dark brown to black spiders, living in silken burrows in the ground or occasionally holes in trees above ground. Their burrows are rarely attached with doors but are sometimes adorned with an expansive silken sheet or curtain-like sheet threads over the entrance.

The genus *Cethegus* contains at least 12 described species, mostly found in open or closed forests of north-eastern Queensland to New South Wales. The species are typical burrow builders but they all construct a distinctive sheet-like web or curtain-like threads over the entrance in order to capture prey that may be wandering nearby. Some of the species also construct dense silken tubes from the outside curtain webs and sheets to the entrance holes below. Some species of *Cethegus* (and the related genus *Namirea*) are known to eat snails living in the rainforests of north-eastern and south-eastern Queensland.

The genus *Cethegus* is represented in this book by one species.

(Plate 137)

Cethegus fugax (Simon, 1908)

Description: Cephalothorax, abdomen and legs dark brown. Body length: 20-25 mm (males); 30-35 mm (females).

Life-history and habits: Commonly known as the Curtain Spider because the female constructs a nest which is composed of numerous vertical strands of silk which measure 10-15 cm in height. Amongst the vertical strands of silk are positioned other silk strands which contain lumps of soil particles; these surround several funnel-shaped tubules which come together lower down in the nest to form a single tube which continues downwards into the shallow, poorly-defined burrow below. From the main mass of silken nest, several thin strands of silk radiate out obliquely for over 20 cm in diameter. These are "trip-threads" which function to capture slow-moving, ground-dwelling prey. The spiders hibernate during winter in the ground. The eggs, egg-sac and other aspects of the species' biology have not been described but are likely to be similar to those of other mygalomorph spiders.

Habitat: Mallee heathlands, open forest, woodlands, deserts.

Distribution: SA, WA.

Photograph: 10 km WSW of Manberry Homestead, WA; male: 22 mm body length.

Family **Nemesiidae**

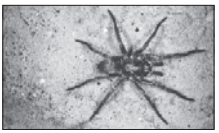
(Australian species: 86; World species: about 330)

This is a medium sized world-wide family of Funnel-web Spiders, all Australian members of which were previously grouped under different families (e.g. Ctenizidae, Dipluridae). 12 genera and 86 species are currently recognized from Australia. The genus *Chenistonia* contains very large, golden-brown, typically hairy spiders measuring up to about 35 mm total body length. The five presently recognised species occur mostly in southern New South Wales, Victoria and Tasmania. The genus *Aname* has been revised recently and now contains 33 recognized species, although the taxonomy is still not clear. Many species previously allocated to this genus have be transferred to other families and genera, while other species from other genera have been transferred to *Aname*. One species, *A. tepperi* Hogg, 1902 (previously *Chenistonia*), is found in the arid areas of coastal southern Western Australia to the Flinders Ranges of South Australia. The genus is a taxonomically difficult one and some of the eastern species are very difficult to distinguish and may represent some undescribed forms. The burrows of *Chenistonia* and *Aname*

are typical of most funnel-web spiders in being an oblique tunnel in the ground with a large brood chamber at the end. The burrow is usually very tightly covered with silk at the base and has a more thicker lining at and below the entrance. In dry areas where the ground is mostly hard, the burrow may be an irregular-shaped one, with many branches that follow natural crevices in the ground. *Chenistonia* spiders are found mostly in open woodlands and dry sclerophyll forests where they live under or in fallen hollow logs and amongst leaf litter and other debris on the ground. The spiders mature during summer to winter depending on prevailing environmental conditions. *Namea* is a relatively new genus of 15 species, mostly found in the montane areas of coastal Queensland. It extends to the Gibraltar Range in northern New South Wales and throughout this range, is found mostly in rainforests. Spiders of this genus build two burrow types. The first type consists of a spider retreat of thin-walled tubes of web, situated under logs, rocks or amongst leaf litter; some species may utilize large amounts of silk and may construct a shallow (about 15 cm) burrow in the ground. These sheltered tubes may be branched or unbranched. The second burrow type consists of thinly lined burrows in the rainforest floor or in earthen banks formed where paths have been cut; such burrows usually lack a leafy collar and are often y-shaped; the main branch is joined at about 5 cm from the surface by a second tube; this second tube reaches to immediately below the surface within several centimetres of the main entrance and thus appears to act as an escape route. *Namea capricornia* Raven, 1984, is only known from the rainforests of the Clarke Range, west of Mackay, Queensland where specimens have been collected from leaf litter and pitfall traps. *Namea brisbanensis* Raven, 1984 is known only from the subtropical rainforests and vine thickets of the mountains west of Brisbane, Queensland. The burrows of the female of this species have a leafy, weakly-defined collar and from about 5 cm below the entrance, a side branch extends upwards to about 1 cm from the surface. The burrows are lined with strong but thick silk and are sinuous and measure up to 20 cm deep. The bottom chamber is slightly enlarged. The burrows of the males have two entrances about 5 cm apart, with each opening comprised of loosely connected white silk forming a broad, weak collar. The two openings connect at about 6 cm below the ground surface. Their burrows are much shorter than those of the females, being about 10 cm deep. Burrows of the males are constructed in loose leaf debris whereas burrows of the females are constructed in compact grey earth. *Namea flavomaculata* (Rainbow and Pulleine, 1918) was originally described from the Mt. Tambourine area early last century and since then little has been recorded on the biology of the species. The female produces a relatively deep burrow measuring up to 30 cm deep which is silk-lined and usually has a collar of leaves which is flush with the ground on the rainforest floor. Like many members of the genus, the burrow is y-shaped with two entrances, one of which is a

concealed exit situated usually within 10 cm from the main entrance. The soil covering the exit is thin and is readily broken by the spider during escape occurrences. The genus *Xamiatus* consists of about 5 species, confined to the mountains of Queensland with one species, *Xamiatus kia* Raven, 1981 occurring in New South Wakes. *Xamiatus rubrifrons* Raven, 1981, is one of the largest mygalomorphs in southern Queensland, where the wandering males are often seen walking along roads at night by motorists and mistaken for funnel-web spiders of the genus *Atrax* (family Hexathelidae).

The family is represented here by one species of *Aname*.



(Plate 138)

Aname tepperi (Hogg, 1902)

Description: Body and kegs dark brown; cephalothorax longer than abdomen; legs, abdomen, and centre of cephalothorax with golden to silver hairs; legs with a large number of black spines. Male is similar to the female in colour pattern and pubescence but is more slender. Body length: 22-25 mm (males); 25-32 mm (females).

Life history and habits: Despite the relative widespread distribution of the species, little has been recorded on its biology and behaviour. The mature adults dig an inclined burrow, usually terminating in a broad chamber. The burrow measures up to about 50 cm in length and is usually lined with a thick covering of silk. During summer the spider may cover the entrance of the burrow with a covering of silk as protection from desiccation resulting from hot, dry weather. *Chenistonia* spiders build their burrows in bare ground, amongst leaf litter, in the sides of creek banks or under rotting logs. They may also inhabit hollow logs. The spiders mature in summer to winter depending on environmental conditions.

Habitat: Woodlands, mallee heathlands, dry sclerophyll forest.

Distribution: WA, SA.

Photograph: Gingin, WA; male: 25 mm body length.

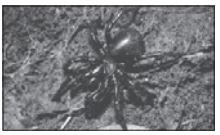
Family **Hexathelidae**

(Australian species: 28; World species: 80)

This is a small family of mygalomorph spider, mainly centered in Australia, where at least 6 genera and 28 species have been described. There are apparently a number of other species awaiting description. They are mostly large, hairy, dark brown to black spiders, living in silken burrows in the ground or in holes and fissures in trees above

ground level. They are the true Funnel-web Spiders, so named because of their habit of building silk-lined burrows which may have an extensive network of webbing outside the entrance which traps their prey. The best known genus in Australia is *Atrax* (sometimes divided into the genus *Hadronyche* and *Atrax*) with at least 13 species having been described, mostly from Queensland, New South Wales and Victoria. At least two species of *Atrax* have been known to cause death in humans. These are well known species, namely the Tree Funnel-web Spider, *A. formidabilis* Rainbow, 1914 (Plate 139), from north-eastern New South Wales and south-eastern Queensland, and the Sydney Funnel-web Spider, *A. robustus* O. Pickard-Cambridge, 1877 (Plates 162, 163), from the Sydney sandstone district of central coastal New South Wales. Other less known and rare species of *Atrax* occur in the mountains of eastern Victoria, southern Queensland and Tasmania. *Atrax* are usually very aggressive spiders which prey mostly on large invertebrates such as beetles, cockroaches and millipedes and small vertebrates such as lizards and frogs. They are large, typically hairy, black and brown spiders, the females of which are larger than the males and may measure up to 50 mm total body length.

The genus represented here is *Atrax* (= *Hadronyche*).



(Plate 139)

Atrax (Hadronyche) formidabilis Rainbow, 1914

Description: Cephalothorax and legs mostly smooth, glossy, black; legs with white and orange-brown bands on the femur and other segments near the body; abdomen dark brown to black with a dense covering of hairs especially on the lateral margins; legs with numerous black spines of varying lengths. Males are similar to the females but have longer and more slender legs, the abdomen is much slimmer and there is a stiff spine (spur) on each of the tibiae of the second pair of legs. Body length: 30-35 mm (males); 35-50 mm (females).

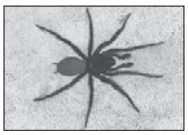
Life history and habits: Commonly known as the Tree Funnel-web Spider or the Northern Rivers Funnel-web Spider. As its scientific epithet suggests, this is a truly formidable species, one of the larger and most deadliest species of Australian spider which should be treated with the utmost caution! There is at least one detailed record of the effects of the bite from this spider upon a human. The first record was made almost 80 years ago in 1926. A man from Wauchope in north-eastern New South Wales was bitten on the bare backside while dressing, the spider apparently entering his clothes during the previous night. He knocked the spider away but as he did so, the spider inflicted another bite, this time on one of his fingers. Initially there was much intense pain in the region of both bites

which later became numb. Within three hours the victim experienced intense vomiting, profuse perspiration and violent cramps in the limbs and in the abdominal muscles. The areas that had sustained the bites remained numb for a considerable time. After three hours, delirium set in and the victim had a frightened, anxious look on his face and claimed that he felt as though somebody was spraying him with liquid. He now experienced impaired breathing, the pupils of his eyes were contracted, and he had a slow, weak pulse. He coughed up large quantities of mucous, much of which dribbled from his mouth uncontrollably. After medical treatment and rest, the victim fortunately recovered. It is possible that in this case, the victim received only a small amount of venom (despite two bites) and it is likely that elderly adults and young children would show different symptoms to a bite. Whatever the case, this spider should be handled carefully or more preferably, left alone! The mature *Atrax formidabilis* mostly frequents holes in tree trunks and branches, in root stumps and fallen logs of rainforest trees usually above the level of the ground (hence the common name of Tree-funnel Web). Sometimes females may nest over 5 metres above ground level in living trees. The natural holes in the moist wood are lined with thick, strong silk which is funnel-shaped and spreading at the entrance, which may be a knot-hole, a bore hole of an insect, or other natural opening. This entrance is usually covered with a tangled, dirty mass of webbing and associated support threads which usually become entangled with fallen leaves, twigs, dust and other debris. This messy entrance acts as a snare for passing insects. The "burrow" which in essence consists of a long silken tube protected by the wood of the tree or stump, may measure up to 100 cm deep (i.e. in hollow logs and standing trees). The entrance to this silken burrow is usually covered during the day by the above-mentioned dirty silken mass but during the night, it is fastened further above the entrance with other strong, silken threads so that the entrance now allows clear access to this nocturnal foraging species. The spiders feed on a wide variety of large insects such as beetles, crickets, moths and other spiders and there have been records of Green Tree Frogs (*Litoria caerulea*, Hylidae) being captured and eaten by large female spiders. The female constructs a white, rectanglar-shaped egg-sac which is suspended near the base of the silken burrow. The egg-sac contains 100-120, yellow-green, globular, non-glutinous eggs, each measuring about 1.5 mm in diameter. The young spiders mature in late summer to autumn and hibernate during the winter in silken retreats in hollow logs and trees, before emerging in the early summer for mating and breeding. Fortunately, these rather nasty spiders are rarely encountered by the layperson since they frequent rugged mountainous areas in south-eastern Queensland and north-eastern New South Wales.

Habitat: Montane rainforests.

Distribution: Q, NSW.

Photograph: Terania Creek, NSW; female: 38 mm body length.



(Plates 162 & 163)

Atrax robustus O. Pickard-Cambridge, 1877

Description: Cephalothorax and legs mostly smooth, glossy, black; legs with white and buff-coloured bands on the femur and other segments near the body; abdomen dark brown to black with a dense covering of hairs especially on the lateral margins; legs with numerous black spines of varying lengths. Males are similar to the females but have longer and more slender legs, the abdomen is much slimmer and is often brownish in colour. Body length: 25-30 mm (males); 30-40 mm (females).

Life history and habits: Commonly known as the Sydney Funnel-web Spider. The males of *A. robustus*, which measure up to 25 mm body length, are most frequently encountered by humans, since they are vagrants and wander incessantly during summer and early autumn seeking females for mating purposes and often crawl into houses during their hunting forays. In their natural habitats, the spiders live under slabs of rock and under fallen logs, while in residential areas, they mostly nest in cool situations under houses. The spread of the species within Sydney suburbs has apparently been associated with the accumulation of tins, boxes and other debris lying around and under houses and sheds and these micro-habitats have been favourable in enlarging the species' range and habitat preferences. Specimens have also been trapped in swimming pools and in pipes and gutterings around houses. The female *A. robustus* rarely ventures from the burrow, unless the soil is disturbed or the burrow flooded by runoff during heavy rains. The burrow is usually situated under a log or stone, in a crevice amongst exposed rocks or at the base of a tree or post. The burrow is lined with silk and measures up to about 30 cm deep; occasionally there may also be an extensive thin sheet-web around the entrance of the burrow. The egg-sac is rectanglar-shaped and pillow-like, composed of thick, very white silk and measures 15-20 mm in length, and is suspended by silken threads from the walls of the burrow near the base. The female produces only one egg-sac per season, which contains 90-120 non-glutinous, translucent, yellow-green, spherical eggs, each measuring about 1.4-1.5 mm in diameter. Like many other Funnel-web Spiders, the spiderlings of *A. robustus*, after emerging from the egg-sac, remain many months with the female in the burrow. The young spiders disperse when old enough and when the environmental conditions are favourable such as after heavy rains when the ground is moist and suitable for construction of burrows. When they emerge from the parental burrow, they leave during the night and each spider digs a small burrow usually taking a few hours. As they grow older, they enlarge the burrow or move to another disused spider burrow. The wandering males are particularly aggressive if disturbed or provoked. Like most mygalomorph

spiders, they attack and bite by raising up the cephalothorax with the fangs open and predominantly exserted outwards. The fangs are brought down repeatedly as the spider lurches and pounces forwards. The Sydney Funnel-web Spider has often been regarded as the world's most deadliest spider but it is probably no more toxic than the Red-back Spider [*Lactrodectus hasselti* (Thorell)- Theridiidae (Plate 125)], which has also been responsible in the past for human deaths. Since the first recorded human death from *A. robustus* in 1927, at least 15 people have died from the bite of this spider. The venom of the male *A. robustus* is about 5 or 6 times more toxic than that of the female. However, in the majority of bites, especially those from the females, no general symptoms follow the bite and recovery is comparatively rapid and uneventful. This is probably due to the fact that the venom often falls from the tips of the fangs before the spider effectively bites. However, with a bite from the male, or one from a female which has injected a large amount of venom, the initial symptoms may occur within only 10 minutes or so. The venom of these spiders contains at least 40 different toxic proteins (peptides), but only one of them, robustoxin, is dangerous to humans. The initial bite is invariably very painful, depending on the depth in the skin that the fangs penetrate, while the venom itself is acidic. Nausea and vomiting are the early symptoms as well as abdominal pains, profuse sweating and excessive salivation. Hypotension may also occur. Muscular paralysis usually does not occur but muscle fasciculation occurs on the limb involved or in other areas away from the bite; this symptom is usually observed in the tongue or lips when the systemic spread of venom has occurred. Later the victim experiences hypertension, tachycardia and disorientation, before succumbing onto a coma, with depressed respiration, asphyxia and cardiac arrest, despite artificial respiration. In a least three cases involving infants, the victims have died within 15-90 minutes, while adults have taken up to 30 hours or more to die. Only recently has an effective antivenom to the Sydney Funnel-web Spider been produced. It has been estimated that 30-40 cases of Funnel-web spider bite occur each year in eastern and southern Australia but only a small number (perhaps 1 in 10) require treatment with antivenom.

Habitat: Woodlands, dry sclerophyll forests.

Distribution: NSW.

Plate 162 is the male, Plate 163 is the female in attack posture.

Family **Idiopidae**

(Australian species: about 70; World species: about 270)

This is a medium-sized family of trap door spiders, mostly found in the subtropical and temperate areas of the southern hemisphere. There are eight genera and 69 described species of the family presently recognized in Australia. Like most

mygalomorph families, this family has undergone much revision in the past decade or so. Many genera previously recognized as distinct have been synonymised with others while other species have been transferred to other families and/or genera. With the exception of the genus *Misgolas*, all of the Australian genera of the family are endemic. *Misgolas* also occurs in New Zealand where there are 42 species known. The genus *Anidiops* contains two species from Western Australia, with one, *A. manstridgei* Pocock, 1897 also extending into South Australia. They are found mostly in the arid and semi-arid areas where they dig deep burrows often sealed with silk and plaster. *Anidiops villosus* (Rainbow, 1914) digs a burrow up to 60 cm deep. The genus *Idiosoma* embraces three species, also endemic to the dry woodlands, heathlands and open forests of south-western Western Australia. *Idiosoma nigrum* Main, 1952 is a large black spider measuring up to 30 mm body length and are easily identified by the rugose nature of the abdomen, the cuticle of which is rather thick and hard and the margins deeply grooved (furrowed). Their burrows have a trap door constructed of small pieces of leaf litter and silk with a fan of leaf and twig trip-lines attached around the rim of the burrow entrance. During the autumn, the much smaller males of *I. nigrum* (measuring up to 18 mm body length) begin to search for females. Mating occurs in the burrow of their chosen mates. Eggs are laid during late spring and early summer and the young spiderlings remain within the female burrow until early winter when adequate rainfall moistens and softens the ground, thus enabling the delicate spiderlings to dig burrows and to avoid water loss from their bodies. Like most mygalomorph spiders, they are very well-adapted for living in hot and dry areas. The burrows of *I. nigrum* are deep enough (maximum of 30-32 cm deep) to ensure that air in the lower part of the burrow remains humid and relatively cool during the heat of summer. The leaf and twig trip-lines radiating from the burrow entrance is another important adaptation of these spiders; these serve as a sensing device in that any potential prey moving over the trip-line alerts the spider awaiting below the burrow entrance that a food source has become available for capture.

The genera *Misgolas* and *Arbanitis* are represented in this book.

(Plate 164)

Arbanitis variabilis (Rainbow & Pulleine, 1918)

Description: Body mostly pale buff brown with some parts of legs with paler shades and often greyish, cephalothorax usually somewhat darker than rest of body; abdomen with distinctive pattern of irregular, brown transverse markings on the dorsal

surface. Males are similar in colour pattern to the females but have a slimmer body. Body length: 20-25 mm (males); 25-30 mm (females).

Life history and habits: Little has been recorded on the biology of this species. These spiders are usually fund in damp, mossy ground and on the upper banks of creeks. The burrow has a thick plug-like door of soil bound tightly with silk. Their food consists of insects, other spiders and occasionally small frogs.

Habitat: Rainforests, wet sclerophyll forests.

Distribution: Q, NSW.

(Plate 165)

Misgolas robertsi (Main & Mascord, 1974)

Description: Cephalothorax and legs mostly black; abdomen orange-brownish with variable pale marks or partial bands on the dorsal surface. Males are similar to the females but have darker coloured abdomens usually without banding and have a slimmer body. Body length: 12-15 mm (males); 18-22 mm (females).

Life history and habits: Commonly known as the Northern Tube Spider. This species digs a moderately deep burrow in the ground for about 20-25 cm with the last few centimetres being composed of very thick hard and papery silk. The burrow extends upwards from the ground as a distinctive tube up to about 40 cm long and is fastened to a rock, tree-stump, log, or tree fern. The exposed tube is covered with pieces of soil, bark, leaf debris etc in order to camouflage the tube against the particular substrate. The egg-sac is rectangular in shape and is suspended by silken strands within the burrow below ground level but not at the base of the burrow. The spiders feed at night on small to medium sized invertebrates that wander near the entrance of the burrow. The species has a scattered distribution in the remaining tropical and subtropical rainforest pockets along the eastern Australian coast from Kingaroy in south-eastern Queensland to about 160 km south of Sydney.

Habitat: Rainforests.

Distribution: Q, NSW.

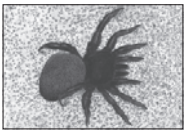
Family **Ctenizidae**

(Australian species: 3; World species: 115)

This is another small, world-wide family which has been recently revised. It used to contain about half of the known species of Australian mygalomorphs but almost all of the genera and species grouped within this family have been transferred to other

families. Only two or three species have been recognized from Australia, but only one, *Conothele doleschalli* Thorell, 1881 is endemic to Australia, with the others also occurring in the Moluccas and Papua New Guinea. The spiderlings of *Conothele* disperse on gossamer threads like those of the Actinopodidae (*Missulena*) the only other group of mygalomorphs which do this. As a consequence, *Conothele* has a northern and inland distribution within Australia. It seems likely that the genus has originated in Asia and spread to Australia from the north. On various islands of the Queensland and Northern Territory coast, the tiny cigar-shaped nests of one species, *Conothele arboricola* Pocock, 1899 occur in the bark of various trees.

The genus *Conothele* is represented by one species in this book.


(Plate 166)

Conothele arboricola Pocock, 1899

Description: Cephalothorax and abdomen dark brown to blackish brown, legs black. Males differ from the females in being slimmer and darker in colour. Body length: 25-28 mm (males); 27-35 mm (females).

Life history and habits: Commonly known as the Tree Trap Door Spider. This is a arboreal species as its scientific names suggests (i.e. tree-loving or tree-inhabiting). The spiders build a distinctive cylindrical, finger-like retreat out of thick silk with a lid at the top. The retreat is attached to the fronds of epiphytic ferns high in rainforest trees or on and under bark. Due to their inaccessibility virtually nothing is known of this species biology and early life stages.

Habitat: Tropical rainforests.

Distribution: Q.

Family **Migidae**

(Australian species: 7; World species: about 80)

This is a small family of mostly medium-sized to large, brown and/or black mygalomorph spiders. mostly distributed in the Pacific region from Australia to South America. They are distinguished from other Australian mygalomorph spiders in lacking a rastellum on the chelicerae (used for burrowing in other mygalomorph spiders) and in also lacking tarsal brushes on the claws. They have stout spines on the legs and have three claws on each tarsus. Three genera and seven species have been described so far from Australia and there appear to be a number of undescribed species, mostly from New Zealand and New Caledonia. *Migas*, a genus also

recorded from Chile, New Zealand and New Caledonia, is represented in Tasmania by *M. nitens* Hickman, 1927 and *M. plomleyi* Raven & Churchill, 1989 and in southern Queensland by *M. variapalpus* Raven, 1984. *Migas nitens* is apparently a rare species, which is poorly represented in museum collections and little is known of its biology. It has been recorded inhabiting beaches in the Hobart district where it now appears to have been displaced by urban development. *Migas variapalpus*, a recently discovered species, appears confined to the rainforests of the Lamington Plateau of the McPherson Range in south-eastern Queensland. The females are similar to the males in general size and colour. Their bodies measure about 8 mm in length, the cephalothorax is brown in the male and yellow-brown with darker brown, irregular margins in the female, while the legs of both sexes are yellow-brown and the abdomens are blue-black. Females construct a shallow burrow about 2-3 cm deep on loose bark at the base of a rainforest tree and cover the entrance with a trap door composed of silk and soil.

Heteromigas is restricted to Australia. These spiders are larger than *Migas*, being 10-12 mm long. Like *Migas*, they are light brown in colour with blue-black abdomens. *Heteromigas dovei* Hogg, 1902, is restricted to northern Tasmania, while a recently described species, *H. terraereginae* Raven, 1984, is known only from montane rainforest near Childers, south-eastern Queensland. Females of this species construct shallow burrows about 3-5 cm deep on the rainforest floor. The burrows are concealed with roughly circular trap doors impregnated with soil and leaf fragments. The mature males are nocturnal and hide during the day amongst leaf litter. They are particularly active during rainy nights during summer.

Glossary

Many of the terms provided below have been explained in the text, but for ease of reference they are given here again, along with numerous other terms used throughout the book or in parts of the book.

abdomen: that part of the spider body posterior to the cephalothorax, containing the bulk of the internal organs of the body; known scientifically as the opisthosoma.

adaptation: the process by which a species, either animal or plant, through the action of mutation and natural selection, develops structural, behavioural or physiological characteristics that enable it to survive in a particular habitat; biologists believe that every living creature still in existence has become successful in its mode of life only through adaptations to its natural environment; it is also believed that those animals and plants which failed to adapt successfully to changing environments became extinct.

anal tubercle: this is a tubercle or swelling on the underside of the spider's abdomen situated posterior to the spinnerets through which the anus opens (see anus below).

anterior: towards the forward or head end of an organism; opposite to posterior.

anus: the rear (posterior) opening of the alimentary canal through which indigestible matter is expelled from the body of a spider and other organisms; the alimentary canal is the specialized tube in which food is digested and absorbed; in most animals it has two openings, the mouth at the anterior end of the body and the anus at the posterior end; different regions are concerned with different stages of digestion and absorption.

apex: the tip or uppermost part.

appendage: a structure which is attached to and projects from the main body of an animal; in spiders, these are the palps, mouthparts, legs and spinnerets.

arachnid: (Arachnida): small segmented animals belonging to the class Arachnida of the Arthropoda phylum of animals (see arthropod below), consisting of scorpions (Scorpionida), false scorpions (Pseudoscorpionida), harvestmen (Phalangida), mites and ticks (Acarina) and spiders (Araneida). The name Arachnid comes from the Greek Arachne. In Greek Mythology, there was once a beautiful maiden called Arachne who was very famous for the quality of the silken materials which she weaved; her fame grew far and wide, so much so, that she became very conceited and began to boast that not even the Goddess Athene could spin as well as her; this angered the Goddess Athene so much that she arranged a contest between her and Arachne to see who could weave the highest quality silk; Arachne put all of her effort into her product and although her weaving was as magnificent as ever, it was still not quite as good as that woven by the perfect Goddess Athene; consequently poor Arachne was punished by the Goddess for her arrogance and haughtiness; Athene turned her into a

spider (i.e. an orb-weaver) thus condemning Arachne to spin a new web every night and to live a tedious, confined existence on those webs for the rest of her life!.

arboreal: living in trees and shrubs, usually not coming in contact with the ground for any length of time.

arthropod: (Arthropoda): this is the Phylum or highest unit of classification of the jointed-legged, invertebrate animals, which consist of the crabs, shrimps etc. (Crustacea), the insects (Insecta), the spiders, scorpions, harvestmen, mites, ticks etc. (Arachnida), the centipedes (Chilopoda) and the millipedes (Diplopoda).

ballooning: this is the process whereby young spiders are dispersed by being suspended and carried through the air on a mass of silken threads or a single thread.

bark: the outermost protective layer of corky tissue, usually containing only dead cells, on the trunks and main branches of woody plants.

book-lungs (or lung-books): these are the respiratory or breathing organs of a spider, which are situated on the ventral surface of the abdomen; araneomorph spiders possess only one pair, while mygalomorph spiders have two pairs.

calamistrum: one or two rows of curved bristles on the metatarsi of the fourth (last) pair of legs of the cribellate spiders, i.e. the House Spiders (Desidae), the Small Orb Weavers (Uloboridae) and the Ogre-faced Spiders (Deinopidae).

caput: head portion of the cephalothorax.

carapace: the hard, sclerotised, dorsal covering or plate of the cephalothorax.

carnivorous: feeding on other animals.

cephalothorax: the first, or anterior, of the two main sections of the spider body, bearing the eyes, mouthparts and legs.

chelicerae (sing. chelicera): the first pair of jaw-like appendages in spiders and other arachnids; each chelicera bears a basal segment and a fang.

chitinous: hard, due to the impregnation of the complex, slightly flexible, fibrous compound known as chitin, which occurs in the exoskeletons of insects, spiders and other arthropods.

class: taxonomic rank composed of one or more orders.

clypeus: that region of the head between the anterior (front) edge of the carapace and the anterior eyes in spiders.

comb: a series of ventral, serrated bristles on the tarsi of the last pair of legs in certain spiders.

compound eye: possessed by most insects and other arthropods and composed of thousands of smaller light-sensitive cells.

cosmopolitan: almost worldwide in distribution.

coxa (pl. coxae): the first segment of the leg (attached to the sternum) or palp (attached to the caput) in spiders.

cribellate: a spider possessing a calamistrum and cribellum (see also calamistrum above and cribellum below).

cribellum: a sieve-like plate situated just in front of the spinnerets in the cribellate spiders; the cribellum produces special, bluish-grey silk known as cribellate silk.

cuticle: this is the external, non-cellular layer covering the bodies of insects, spiders and other arthropods, which is secreted by one or more layers of cells known as the epidermis; the function of the cuticle is to reduce moisture loss from the body.

diurnal: active during the daytime.

dorsal: on the upper (back) surface of the body.

ecdysis: the process of moulting and shedding of the skin between each stage of growth.

ecosystem: the sum total of all living organisms and non-living objects in a defined region and the relationships between them; e.g. the ecosystem of a pond consists of water, rocks, debris and all the living things in that pond such as fish, frogs, algae, water weeds, snails etc.

endemic: occurring naturally only within a particular area.

epigastric furrow: a ventral groove situated behind the book-lungs on the abdomen of spiders.

epigynum: a hard, sclerotised structure which covers the genital openings of most female spiders; the epigynum contains openings through which the sperm from the male spider is transferred into the special sperm-holding structures known as spermathecae.

exoskeleton: this is the hard, outer covering of arthropods, i.e. the skeletons of insects, spiders, scorpions, ticks, mites etc.

family: taxonomic rank composed of one or more genera of similar characteristics.

fang: the claw-like distal segment of the chelicera, through which poison is injected into the prey.

fauna: the sum total of animal life of a given habitat or region.

femur: the main (third) segment of the legs of insects and arachnids.

fertile: capable of producing young.

fossorial: living and burrowing in the ground.

genus (pl. genera): taxonomic rank composed of one or more species of similar characteristics.

glutinous: sticky; the eggs of some spiders may be glued together in an egg-sac or retreat in a sticky mass.

habitat: the characteristic environment of a particular individual or species.

heath (heathland): a community of mostly small, shrubby plants (often prickly) usually growing in a cool, dry climate, or sometimes in tropical areas, generally on nutrient-poor soils.

indigenous: native to an area.

integument: outer covering or skin of an animal.

invertebrate: an animal without an internal body skeleton, i.e. insects, spiders, worms, crustaceans, centipedes, millipedes, etc.

labium: this is the ventral (lower) lip of a spider, situated between the maxillae (see below) and the front of the sternum; it is used to assist the straining of food into the mouth.

lateral: on the sides or the margins.

laterigrade: a condition of the legs of some spiders, e.g. Thomisidae and Sparassidae, where the proper dorsal surface of each leg is rotated so as to become the posterior surface; these spiders, because of this condition, are able to move sideways as well as forwards in a similar fashion to crabs (hence the often common name of Crab Spider given to these arachnids).

longitudiunal: meaning lengthways.

maxillae (sing. maxilla): these are the modified coxae (or last segment) of the palps which are used as a pair of crushing plates.

median: situated at or near the midline or centre.

median eyes: these are the two intermediate eyes of each row of four eyes on the caput of certain spiders (some spiders do not have two rows of four eyes, but have three rows of eyes, i.e. 3,3,2 and so only the first two rows have an intermediate or median eye).

metatarsus: the sixth segment of each spider leg.

mimicry: similarity between one species or organism and another, not necessarily related.

morphology: the form and structure of an organism.

nocturnal: active at night.

ocelli (sing. ocellus): light receptor (simple eye) of many invertebrates (including spiders which usually have eight or a reduced number).

order: taxonomic rank composed of one or more families.

ovate (ovoid): egg-shaped.

palps (palpal organs): the second appendage of the cephalothorax, situated posteriorly to the chelicerae and anteriorly to the first pair of legs; in the male spider they are modified as mating organs (palpal organs).

patella: the fourth segment of the legs and palps in spiders.

pedicel: portion of the spider body connecting the cephalothorax to abdomen.

prograde: the type of legs found in most spiders which are adapted for forward movement only; opposite to laterigrade.

prosoma: cephalothorax.

rainforest: a closed forest found in humid tropical, subtropical and temperate areas containing numerous species of large trees, climbers, ferns, mosses and fungi; there are various types of rainforest, classified on the basis of structure and composition of plant species.

sclerophyll forest: plant community dominated by hard-leaved trees and shrubs, mostly *Eucalyptus* species, commonly occurring in eastern and southern Australia; there are two main types: dry sclerophyll forests, which contain plants adapted to poorer soils in areas of moderate to sparse rainfall especially on the Great Dividing Range, and wet sclerophyll forests which often border or merge with rainforests in usually wetter, montane areas.

sclerotized: structure hardened by the impregnation of chitin, a complex protein.

scopulae (sing. scopula): tufts or brushes of specialized setae on the legs and maxillae of spiders.

secretion: a fluid or other substance issuing from a gland or special cell.

sedentary: inactive, not regularly moving from place to place.

setae (sing. seta): bristles, spines, hairs or scales arising from the cuticle on various parts of the invertebrate body and mostly having a sensory function.

sexual dimorphism: the condition in which the male and female of the same species appear different in size, colour, shape, structure etc., or a combination of these.

solitary: inclined to live alone, not in colonies.

species: the taxonomic unit universally used in the classification of organisms; a species is now generally considered to be a population or group of populations within which interbreeding occurs freely in nature; as a general rule, one species is unable to interbreed with another.

spermathecae (sing. spermatheca): these are the receptacles in the internal genitalia of female spiders which the male deposits during copulation.

spinnerets: these are the finger-like appendages usually situated near or at the apex on the underside of the abdomen in spiders from which the silk is withdrawn; there are usually three pairs, the anterior, median and posterior pairs, the median pair usually being the smallest.

stabilamentum: thick, ribbon-like, silken threads which are placed in orb-webs by certain spiders of the family Araneidae (Argiopidae).

sternum: ventral plate of the cephalothorax.

stridulation: in invertebrates, this is the action of rubbing a leg, palp or other part of the body across another part of the body usually having spines, in order to produce high-pitched sounds or squeaking noises; many mygalomorph spiders (e.g. Theraphosidae) have this ability.

substrate: the surface on which an organism is living or growing, i.e. soil, bark, rocks etc.
tarsus (pl. tarsi): seventh (last) segment of the leg and sixth (last) segment of the palps in spiders.
taxon (pl. taxa): a unit of classification, e.g. species, genus, family.
taxonomy: the study of the systematic classification of living organisms, and the naming of new taxa (nomenclature).
tibia (pl. tibiae): fifth segment of the leg or palps in spiders.
thoracic fovea (pl. foveae): small groove in the carapace of the cephalothorax which corresponds to the internal attachments of the spider's muscles.
tracheae (sing. trachea): invertebrate breathing tubes which open out on the surface of the abdomen at the tracheal spiracles.
tracheal spiracles: see tracheae above.
trichobothria: specialized, very fine, sensory hairs on the legs and palps in spiders.
trochanter: second segment of the legs and palps in spiders.
ventral: on the undersurface.

References

The references listed below include the main ones used as a basis for some of the information included in this book. This bibliography is not intended to be an exhaustive list of Australian spider literature, but will serve as a useful introduction for those embarking on serious study of our Arachnida. A number of books have been published in the past dealing with Australian spiders. These are listed below before the list of scientific references for each spider family covered in this book.

General Books on Australian Spiders (Note: most are out of print except for some of the more recent publications)

BRUNET, B. (1996). *Spider Watch: A Guide to Australian Spiders*. Reed New Holland, Sydney. [This is one of a few spider books presently available in Australia. It has some most beautiful photos of Australian spiders but the coverage is rather small].

CHILD, J. (1965). *Australian Spiders*. Periwinkle Press, Sydney. [A revised edition of this book was published in 1968 by Cheshire-Lansdowne, Sydney. This was the first well illustrated book on Australian spiders, which provided both colour and black/white photographs of a number of species and overall proved to be a good introduction to the native spider fauna. The book enabled for the first time many of our spiders to be clearly identified through pictorial means (although the book has some misidentifications)].

CLYNE, D. (1969). *Australian Spiders*. Nelson, Melbourne. [This book provided a great deal of accurate scientific information on Australian spiders as well as much data on biology and web structure. It was illustrated by many photographs, but unfortunately the print quality let the book down as well as the small photographic reproductions. It is presently out of print as well as out of date].

FROGGATT, W.W. (1935). *Australian Spiders and their Allies*. [This is a rare out of print book which is rarely or if ever cited in the mainstream scientific literature. It introduces the Australian spider fauna and illustrates some species with black/white photographs but the coverage is small. Nevertheless it appears to have been the first general book on Australian spiders ever published].

HICKMAN, V.V. (1968). *Spiders of Tasmania*. [This is a very useful book which covered a small sample of the Tasmanian spider fauna in some detail, with line drawings and black/white photographs. It is currently out of print].

MAIN, B.Y. (1964). *Spiders of Australia*. Jacaranda Press, Sydney, Brisbane, Melbourne. [This appears to have been the first scientific/general book published on the Australian spider fauna and was reprinted in 1967 by Jacaranda Press and again in 1980 by Axiom Books. It contains many line drawings but no photographs are included. It is presently out of print].

MAIN, B.Y. (1976). *Spiders*. Australian Naturalists Library, Collins, Sydney. [This book, also out of print, is one of the best readable accounts of Australian spiders, although very few species are actually described or illustrated and as such the book was not meant to be a field guide. A second edition was published in 1984].

MCKEOWN, K.C. (1963). *Australian Spiders*. Sirius Books, Sydney. [This book became out of print well over 30 years ago and is now a collector's item. It contains a number of black and white illustrations and is written in a very easily-read style].

MASCORD, R. (1970). *Australian Spiders in Colour*. Reed, Sydney. [Unfortunately, this book is out of print as well. It provided much new information on the biology of Australian spiders as well as providing a large number of colour photographs which assisted identification].

MASCORD, R. (1983). *Spiders of Australia: A Field Guide*. Reed Books, Sydney. [This book became out of print quickly and was never reprinted as far as I am aware. This in unfortunate because at the time of its publication, this book was probably the best available on Australian spiders in terms of indentification. The book covered much new ground and provided colour photographs of species never before illustrated. Mascord also provided much new original field information on many of the species. Most of the major spider families were covered but there some major families such as the Lycosidae and Salticidae which were unfortunately omitted, possibly because of space limitations].

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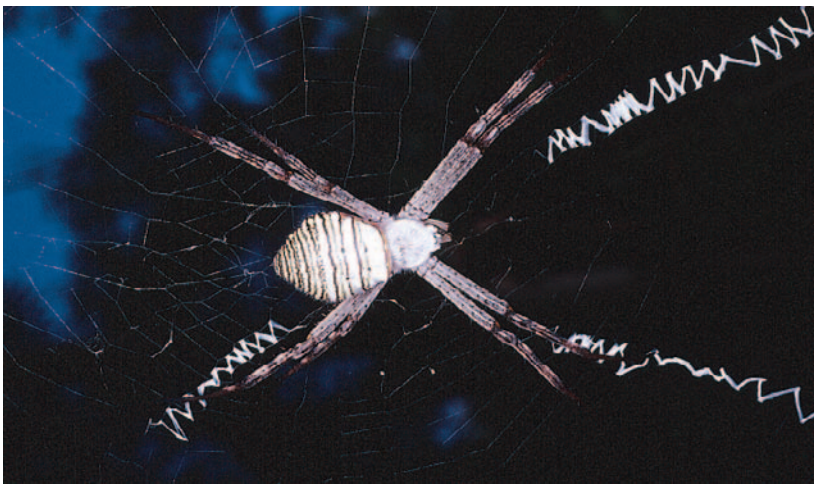

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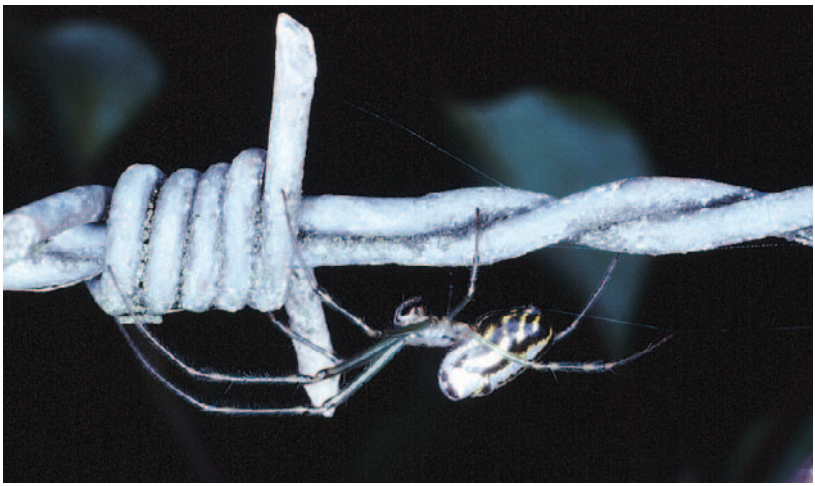

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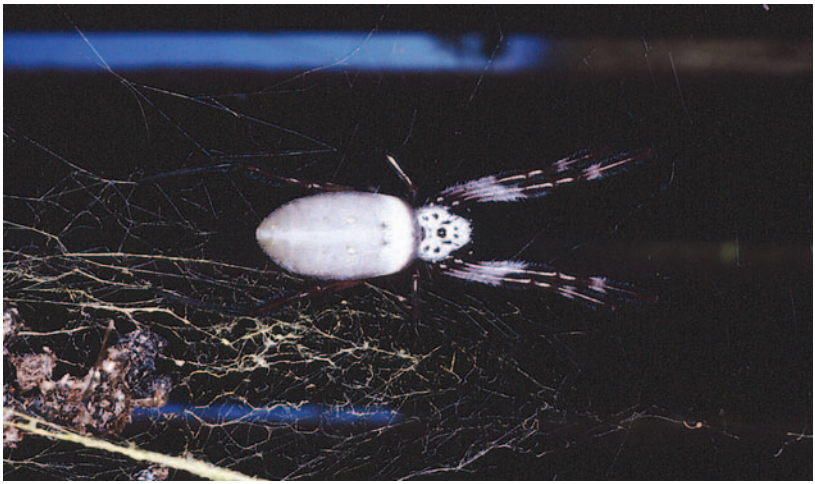

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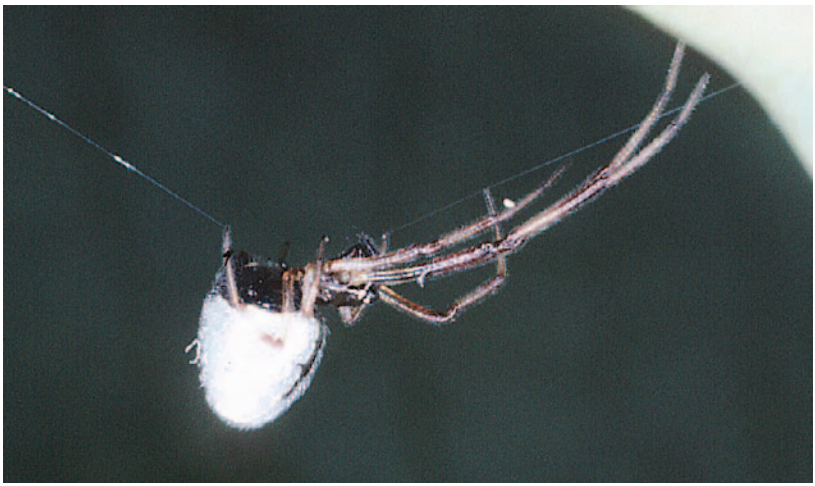

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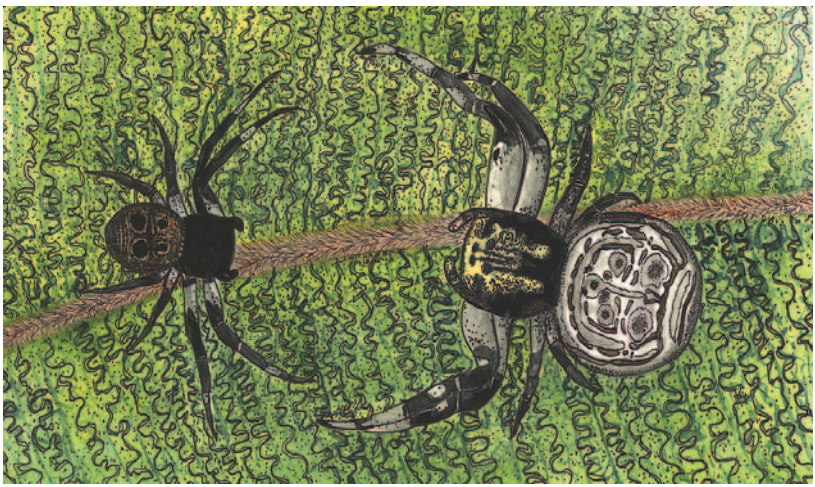

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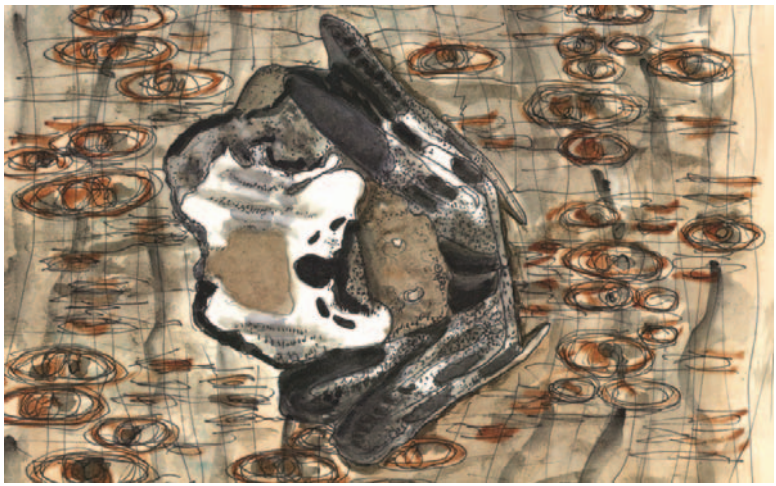

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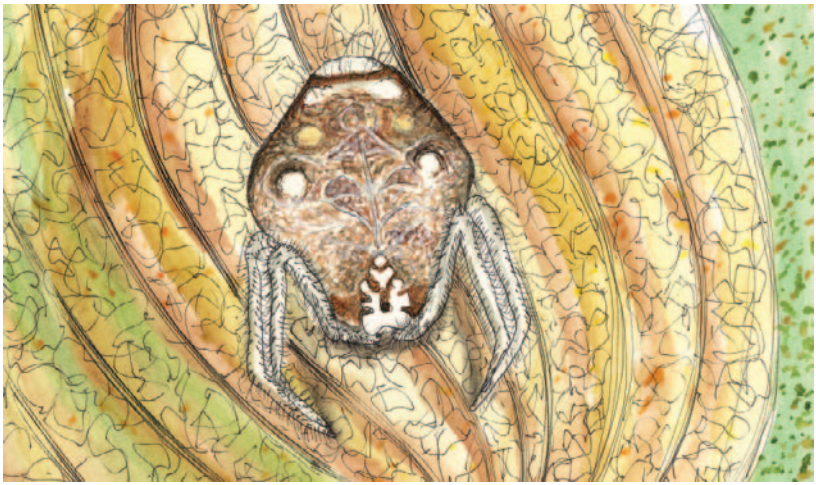

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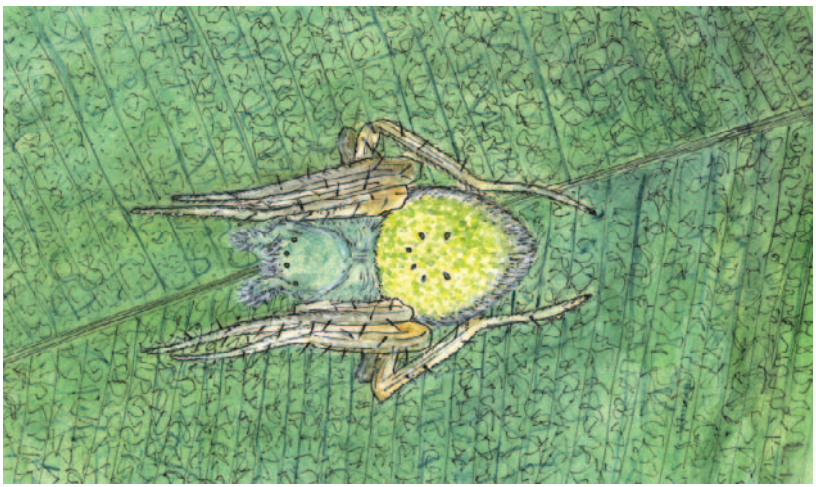

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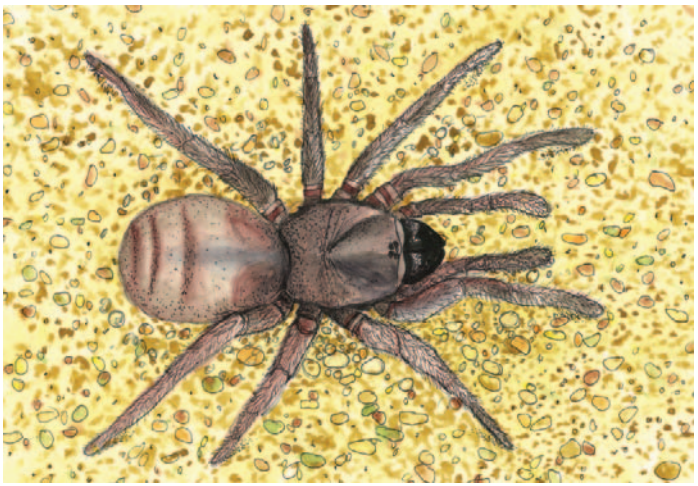

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